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Compaq ProLiant 2500 Servers Installation Guide

First Edition (September 1996)
Part Number 271956-001

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Using This Guide

The *Compaq ProLiant 2500 Servers Installation Guide* is intended to help you set up your server for optimal performance. Use this guide along with the technical information on the configuration and installation poster, the hood labels, the Systems Reference Library CD, the SmartStart CD, and the Management CD for complete and comprehensive reference source materials. For the first time, you can now easily and quickly access much of the server's configuration and installation technical information by using the poster or the hood labels.

How this Manual is Organized

This guide describes the features, configuration, diagnostics, and technical specifications of your new server. The manual is divided into the following chapters:

- Chapter 1 - Provides an overview of the ProLiant 2500 tower model server and its features.
- Chapter 2 - Provides an overview of the ProLiant 2500R rack model server and its features.
- Chapter 3 - Covers the initial ProLiant 2500 installation and hardware upgrades.
- Chapter 4 - Covers the initial ProLiant 2500R installation and hardware upgrades.
- Appendixes - Cover electrostatic discharge, specifications, connectors, cables, regulatory compliances, and CD-ROM operating instructions.

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Symbols In Text

WARNING: Text set off in this manner indicates that failure to follow directions in the warning can result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions can result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Symbols in Equipment

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists. To avoid risk of injury from a hot component, allow the surface to cool before touching.

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts. To avoid risk of injury from electrical shock hazards, do not open this enclosure.

WARNING: Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection. To avoid risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

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Where to Go for Help

Major sources of additional information are as follows:

- Compaq CDs that contain online documents
- Other hardcopy documents
- Compaq Web Site (http://www.compaq.com)
- Compaq Authorized Reseller or Service Provider

Compaq CDs

Compaq Systems Reference Library CD

Compaq Systems Reference Library CD is located in the Reference Information pack and includes the following online documents:

- Diagnostics
- Insight Manager documentation
- Integration TechNotes
- Part number lists
- SCSI and other options guides
- Security Management
- Server Maintenance and Service Guides (MSGs)
- Server reference guides

Compaq SmartStart CD

Compaq SmartStart CD is located in the Server Setup and Management pack and contains:

- System Configuration Utility software
- ROMPaq
- Drivers

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Compaq Management CD

Compaq Management CD is located in Server Setup and Management pack and contains:

- Insight Manager Utility software
- Online Help for the Insight Manager Utility

Other Hardcopy Documents

The following hardcopy documents are available for your use:

- Hood labels located on the inside of Side Access Panel and Top Access Panel
- *Compaq Integrated Remote Console User Guide*
- *Compaq ProLiant 2500 and 2500R Hardware Installation and Configuration Poster*

Compaq Web Site

The Compaq Web Site has Compaq ProLiant 2500 information. You will need to log onto the Internet to access the Compaq Web Site (http://www.compaq.com).

Compaq Authorized Reseller or Service Provider

Call one of the technical support telephone numbers listed below to locate your nearest Compaq Authorized Reseller or Service Provider.

Compaq Worldwide Technical Support Telephone Numbers

Location	Voice	FAX
APD	65-7503030	65-7504909
Argentina	54-1 313 3100	54-1 313 3100 Ext 21
Australia	61-2-9911-1955	61-2-9911-1900
Austria	0222-87816-16	0222-87816-82
Bahrain	973-210-214	
Belgium	(02) 716-96-96	(02) 725-22-13
Brazil	55 11 5505-3600	55 11 5505-3922 Ext 4336
Canada	1-800-386-2172	
Caribbean	1-800-345-1518	
Central America	713-378-2206	

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Compaq Worldwide Technical Support Telephone Numbers *Continued*

Location	Voice	FAX
Chile	562-274-3007	
China	86-10-834-6721	86-10-834-6713
Colombia	571-345-0266	571-312-0157
Czech Republic	42-2-232-8772	42-2-232-8773
Denmark	45-90-4545	45-90-4595
Equador	593-2504540	
Europe/Middle East/Africa	(49) 089-9933-2891	
Finland	9800-206-720 (358-800-1-206720)	90-6155-9899 (358-0-61559899
France	(33 1) 41-33-4455	(33 1) 41-33-4263
Germany	0180-5-212111	089-9933-3399
Hong Kong	852-90116633	852-28671734
Hungary	36-1-201-8776	36-1-201-9696
India	(91-80) 559-6023	
Italy	392-57-90300	392-575-00686
Japan	0120-101589	81 3-5402-5959
Korea	82-2-523-3575	82-2-3471-0321
Malaysia	(603) 718-1636	
Mexico	(525) 229-7910	(525) 229-7988
Netherlands	06-91681616	06-8991116
New Zealand	649-307-3969	
Norway	22-072-020	22-072-021
Poland	48-2-630-3535	48-2-630-3553
Portugal	351-1-4120132	351-1-4120654
Singapore	65-7503030	65-7504909
South Africa	27-11-728-6999	27-11-728-3335
Spain	341-640-1302	341-640-0124
Sweden	(46) 8 703 5240	(46) 8 703 5222
Switzerland	411 838 410/2222	01-837-0969
Taiwan	(886) 2-3761170	(886) 2-7322660
Thailand	62-2-679-6222	62-2-679-6220
United Kingdom	44-81-332-3888	44-81-332-3409
United States	1-800-386-2172	1-800-345-1518
Venezuela	(582) 953.69.44	(582) 952.86.70

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Chapter 1
Compaq ProLiant 2500 Features

The Compaq ProLiant 2500 is the next generation of mainstream servers that use the latest Pentium Pro processor technology to meet customer applications and file/print computing requirements. ProLiant 2500 is an affordable business-critical server capable of delivering Error Checking and Correcting Memory, PCI architecture, hot-pluggable drives, integrated Fast Ethernet, Integrated Remote Console, and integrated Wide-Ultra SCSI Controller on the PCI Local Bus. The new ProLiant 2500 server chassis significantly improves system serviceability and upgradability.

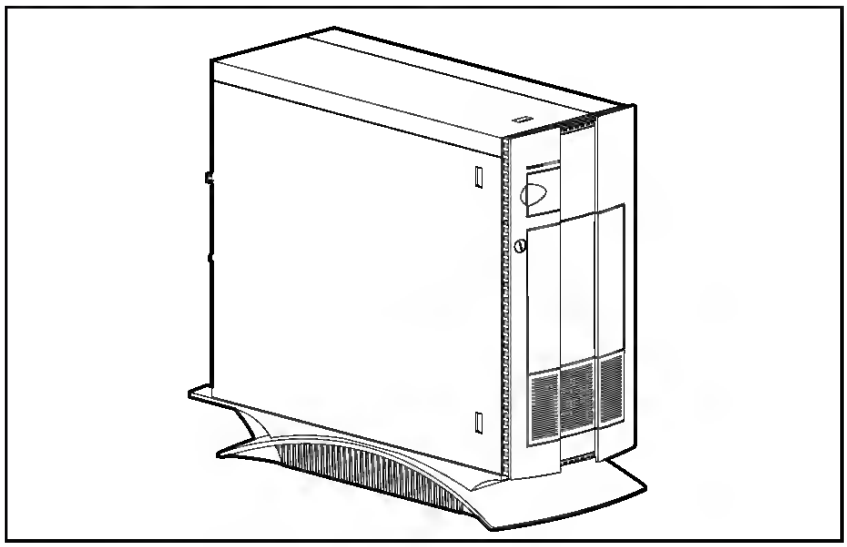

Figure 1-1. Compaq ProLiant 2500

Customer Support

Compaq servers are backed by comprehensive and flexible customer support programs. Refer to your SmartStart CD for information on Compaq Service Providers and Authorized Compaq Resellers in your area.

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Standard Features

The following features are standard on Compaq ProLiant 2500 models, unless otherwise noted:

Server Models with Compaq Processor Board and Intel Pentium Pro Processor

- Standard with one 200-MHz Intel Pentium Pro Processor and integrated 256-KB Level 2 Cache
- Support for two 200-MHz Intel Pentium Pro Processors
- Upgradable to future Intel processors and OverDrive processors

Pentium Pro Processor System Memory

- Error Checking and Correcting Memory uses an encoding scheme for memory error detection and correction. Specifically, this feature detects and corrects for single-bit memory errors.
- 32-MB, EDO-buffered, 64-bit system memory expandable to I GB
- Supports 60-ns or faster EDO- or FASTPAGE-buffered, 32-, 64-, 128-, or 256-MB, 4-K refreshed DIMMs.

Expansion Slots

- Six expansion slots: two dedicated PCI slots and four shared PCI/EISA slots
- The Extended Industry Standard Architecture (EISA) bus provides an open 32-bit extension to support 32-bit EISA expansion boards, including full compatibility with Industry Standard Architecture (ISA) expansion boards.
- The PCI bus provides peripheral transactions at a system clock speed of up to 33 MHz.

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Disk Controller

- Integrated Wide-Ultra SCSI Controller on the PCI local bus. Controller provides high-performance options for up to five devices without using an expansion slot. This controller performs at a maximum data transfer rate of 40 megabytes per second (MB/s).
- Optional controller board available for controller duplexing or expanding storage capacity beyond five drives.
- For information concerning the SCSI hard drive installation, refer to the Systems Reference Library CD included in the Reference Information pack.

Network Controller

- Integrated 10/100 TX UTP controller on the PCI local bus. Features of the controller include the RJ-45 connector for 10BaseT or 100TX Ethernet and the AUI connector for 10Base2 Ethernet.
- For information concerning the integrated network controller, refer to the Systems Reference Library CD included in the Reference Information pack.

Mass Storage for Hot-Pluggable Models

- Maximum of nine drive bays (four non-hot pluggable in removable media drive area and five hot-pluggable in drive cage)
  - One-third height dedicated removable media drive bay occupied by 1.44 MB diskette drive
  - One-third height removable media drive bay occupied by IDE CD-ROM drive
  - Two half-height vacant 5.25" removable media drive bays
  - Supports two hot-pluggable drive configurations in the front drive cage, five 1" hot-pluggable drives *or* two 1.6" and one 1" hot-pluggable drives

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Mass Storage for Non-Hot-Pluggable Models

- Maximum of eight non-hot-pluggable drive bays (four in removable media drive area and four in drive cage)
  - One-third height dedicated removable media drive bay occupied by 1.44 MB diskette drive
  - One-third height removable media drive bay occupied by IDE CD-ROM drive
  - Two half-height vacant 5.25" removable media drive bays
  - Supports up to four 1.6" non-hot-pluggable drives in the front drive cage

Standard Interfaces

- Wide-Ultra SCSI
- Serial (2)
- Video
- Parallel
- Keyboard
- Mouse
- Ethernet - 10BaseT or 100TX (RJ-45) and 10Base2 (AUI)

Video

- Integrated Video Controller provides maximum resolution of 1024 x 768 non-interlaced resolution.
- 16 to 256 colors, depending on graphics mode
- Supports SVGA, VGA, and EGA graphics resolution

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ROM

- Software upgradable firmware
- ROMPaq Utility used to upgrade ROM

Power Supply

- 325-W power supply

Warranty

- Three-Year On-Site Limited Worldwide Warranty
- Prefailure warranty on processors, memory, and hard drives

Server Configuration and Management

Compaq offers an extensive set of features and optional tools to support effective server management and configuration. These features fall into the categories listed below:

- SmartStart
- Server Management
- Compaq Insight Manager
- Compaq System Configuration Utility
- Compaq Integrated Remote Console

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Compaq SmartStart

SmartStart, which is located on the SmartStart CD, is the intelligent way to configure your Compaq server with Novell, Microsoft, SCO, and IBM system software. SmartStart uses a step-by-step process to configure the server and to load the system software, thereby achieving a well-integrated server to ensure maximum dependability and supportability. The SmartStart CD also holds the Compaq System Configuration Utility and ROMPaq. For information concerning SmartStart, refer to the Server Setup and Management pack included in the shipping box.

Server Management

Server management features provide in-depth monitoring, analysis, and control of the fault tolerance, performance, and configuration aspects of the servers. Server management features include:

- Server Parameter Tracking
- Server Fault Tolerance
- Recovery Services
- Remote Services Features

For information concerning server management features, refer to the Systems Reference Library CD included in the shipping box.

Compaq Insight Manager

Compaq Insight Manager, which is loaded from the Compaq Management CD, is an easy-to-use and intuitive software utility for collecting server information. Insight Manager performs the following functions:

- Forwards server alerts fault conditions
- Monitors fault conditions and server performance

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- Controls server security and configuration
- Remotely controls servers
- Initiates rapid recovery services

In Compaq servers each hardware subsystem, such as disk storage, system memory, and system processor, has a robust set of management capabilities. Compaq's Full-Spectrum Fault Management prevents faults before they happen, keeps the system up and running in the unlikely event of a failure, and delivers rapid server recovery to normal operation after a fault. For information concerning Compaq Insight Manager, refer to the Server Setup and Management pack included in the shipping box.

Compaq System Configuration Utility

The Compaq System Configuration utility performs a wide range of configuration activities including the following:

- Configures EISA and PCI boards automatically
- Provides switch and jumper settings
- Resolves resource conflicts in areas such as memory, port addresses, and interrupts (IRQs)
- Manages the installation of memory, processor upgrades, and mass storage devices such as hard drives, tape drives, and diskette drives
- Sets and stores power-on features like date and time
- Stores configuration information in nonvolatile memory
- Assists in the installation of the operating system
- Assists in running diagnostic tools such as TEST and INSPECT Utilities

The first time the server is configured, the SmartStart program automatically creates a system partition and installs the configuration utility and other Compaq utilities in that partition. For information concerning this utility, refer to the SmartStart documentation and the Systems Reference Library CD included in the shipping box.

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Compaq Integrated Remote Console

The standard Compaq Integrated Remote Console performs a wide range of configuration activities including the following:

- Accessible using ANSI terminal
- Operates independently of the operating system
- Provides for remote server reboot
- Provides access to system configuration
- Uses out-of band communication with dedicated management modem installed in the server

For information concerning the standard Integrated Remote Console, refer to the *Integrated Remote Console User Guide* included in the shipping box.

Security Features

Security features are as follows:

- Keyboard Password
- Administrator Password
- Network Server Mode
- QuickLock
- Diskette Drive Control
- Diskette Write Control
- Diskette Boot Override
- Serial Interface Control
- Parallel Interface Control

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- Configuration Lock
- Security Lock Provision

These security features are established through the Compaq System Configuration Utility. For information concerning server security features, refer to the Systems Reference Library CD and the SmartStart CD included in the shipping box.

Diagnostic Tools

The software and firmware diagnostic tools available for your use are:

- Power-On Self-Test (POST)
- Diagnostics (DIAGS)
- ROMPaq utilities to upgrade flash ROMs
- Automatic Server Recovery (ASR-2)

For information concerning Compaq diagnostic tools, refer to the Systems Reference Library CD included in the Reference Information pack of the shipping box.

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Chapter 2
Compaq ProLiant 2500R Features

The Compaq ProLiant 2500R is the next generation of mainstream servers that use the latest Pentium Pro processor technology to meet customer applications and file/print computing requirements. ProLiant 2500R is an affordable business-critical server capable of delivering Error Checking and Correcting Memory, PCI architecture, hot-pluggable drives, integrated Fast Ethernet, Integrated Remote Console, and integrated Wide-Ultra SCSI Controller on the PCI Local Bus. The new ProLiant 2500R server chassis significantly improves system serviceability and upgradability.

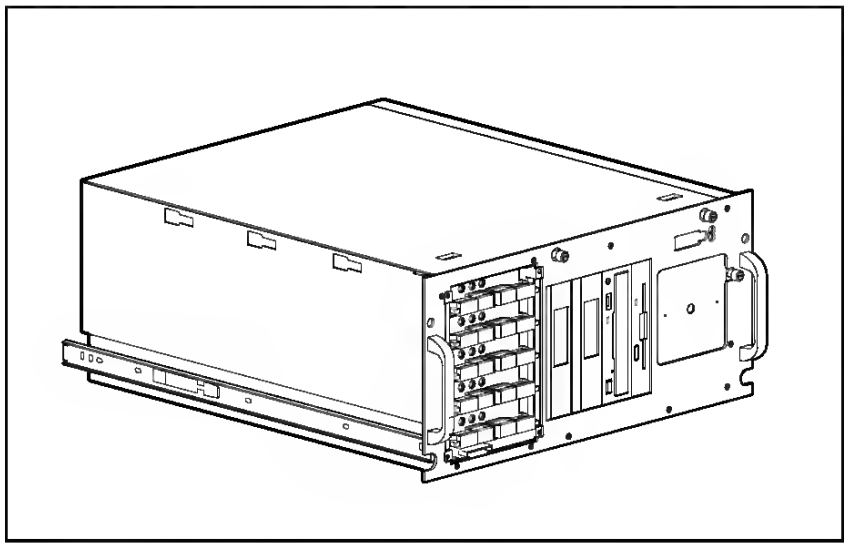

Figure 2-1. Compaq ProLiant 2500R

Customer Support

Compaq servers are backed by comprehensive and flexible customer support programs. Refer to your SmartStart CD for information on Compaq Service Providers and Authorized Compaq Resellers in your area.

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Standard Features

The following features are standard on Compaq ProLiant 2500R models, unless otherwise noted:

Compaq Processor Board and Intel Pentium Pro Processor

- Standard with one 200-MHz Intel Pentium Pro Processor and integrated 256-KB Level 2 Cache
- Support for up to two 200-MHz Intel Pentium Processors
- Upgradable to future Intel processors and OverDrive processors

System Memory

- Error Checking and Correcting Memory uses an encoding scheme for memory error detection and correction. Specifically, this feature detects and corrects for single-bit memory errors.
- 32-MB, EDO-buffered, 64-bit system memory expandable to I GB
- Supports 60-ns or faster EDO- or FASTPAGE-buffered, 32-, 64-, 128-, or 256-MB, 4-K refreshed DIMMs.

Expansion Slots

- Six expansion slots: two dedicated PCI slots and four shared PCI/EISA slots
- The Extended Industry Standard Architecture (EISA) bus provides an open 32-bit extension to support 32-bit EISA expansion boards, including full compatibility with Industry Standard Architecture (ISA) expansion boards.
- The PCI bus provides peripheral transactions at a system clock speed of up to 33 MHz.

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Disk Controller

- Integrated Wide-Ultra SCSI Controller on the PCI local bus. Controller provides high-performance options for up to five devices without using an expansion slot. This controller performs at a maximum data transfer rate of 40 megabytes per second (MB/s).
- Optional controller board available for controller duplexing or expanding storage capacity beyond five drives.
- For information concerning SCSI hard drive installation, refer to the Systems Reference Library CD included in the Reference Information pack.

Network Controller

- Integrated 10/100 TX UTP controller on the PCI local bus. Features of the controller include an RJ-45 connector for 10BaseT Ethernet and an AUI connector for 10Base2 Ethernet.
- For information concerning the integrated network controller, refer to the Systems Reference Library CD included in the Reference Information pack.

Mass Storage

- Maximum of nine drive bays (four non-hot pluggable in removable media drive area and five hot-pluggable in drive cage)
  - One-third height dedicated removable media drive bay occupied by 1.44 MB diskette drive
  - One-third height removable media drive bay occupied by IDE CD-ROM drive
  - Two half-height vacant 5.25" removable media drive bays
  - Supports two hot-pluggable drive configurations in the front drive cage, five 1" hot-pluggable drives *or* two 1.6" and one 1" hot-pluggable drives

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Standard Interfaces

- Wide-Ultra SCSI
- Serial (2)
- Video
- Parallel
- Keyboard
- Mouse
- Ethernet - 10BaseT or 100TX (RJ-45) and 10Base2 (AUI)

Video

- Integrated Video Controller provides maximum resolution of 1024 x 768 non-interlaced resolution.
- 16 to 256 colors, depending on graphics mode
- Supports SVGA, VGA, and EGA graphics resolution

ROM

- Software upgradable firmware
- ROMPaq Utility used to upgrade ROM

Power Supply

- 325-W power supply

Warranty

- Three-Year On-Site Limited Worldwide Warranty
- Prefailure warranty on processors, memory, and hard drives

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Server Configuration and Management

Compaq offers an extensive set of features and optional tools to support effective server management and configuration. These features fall into the categories listed below:

- SmartStart
- Server Management
- Compaq Insight Manager
- Compaq System Configuration Utility
- Compaq Integrated Remote Console

Compaq SmartStart

SmartStart, which is located on the SmartStart CD, is the intelligent way to configure your Compaq server with Novell, Microsoft, SCO, and IBM system software. SmartStart uses a step-by-step process to configure the server and to load the system software, thereby achieving a well-integrated server to ensure maximum dependability and supportability. The SmartStart CD also holds the Compaq System Configuration Utility and ROMPaq. For information concerning SmartStart, refer to the Server Setup and Management pack included in the shipping box.

Server Management

Server management features provide in-depth monitoring, analysis, and control of the fault tolerance, performance, and configuration aspects of the servers. Server management features include:

- Server Parameter Tracking
- Server Fault Tolerance
- Recovery Services
- Remote Services Features

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For information concerning server management features, refer to the Systems Reference Library CD included in the shipping box.

Compaq Insight Manager

Compaq Insight Manger, which is loaded from the Compaq Management CD, is an easy-to-use and intuitive software utility for collecting server information. Insight Manager performs the following functions:

- Forward server alerts fault conditions
- Monitor fault conditions and server performance
- Control server security and configuration
- Remotely control servers
- Initiate rapid recovery services

In Compaq servers each hardware subsystem, such as disk storage, system memory, and system processor, has a robust set of management capabilities. Compaq's Full-Spectrum Fault Management prevents faults before they happen, keeps the system up and running in the unlikely event of a failure, and delivers rapid server recovery to normal operation after a fault. For information concerning Compaq Insight Manager, refer to the Server Setup and Management pack included in the shipping box.

Compaq System Configuration Utility

The Compaq System Configuration utility performs a wide range of configuration activities including the following:

- Configures EISA and PCI boards automatically
- Provides switch and jumper settings
- Resolves resource conflicts in areas such as memory, port addresses, and interrupts (IRQs)
- Manages the installation of memory, processor upgrades, and mass storage devices such as hard drives, tape drives, and diskette drives
- Sets and stores power-on features like date and time

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- Stores configuration information in nonvolatile memory
- Assists in the installation of the operating system
- Assists in running diagnostic tools such as TEST and INSPECT Utilities

The first time the server is configured, the SmartStart program automatically creates a system partition and installs the configuration utility and other Compaq utilities in that partition. For information concerning this utility, refer to the SmartStart documentation and the Systems Reference Library CD included in the shipping box.

Compaq Integrated Remote Console

The standard Compaq Integrated Remote Console performs a wide range of configuration activities including the following:

- Accessible using ANSI terminal
- Operates independently of the operating system
- Provides for remote server reboot
- Provides access to system configuration
- Uses out-of band communication with dedicated management modem installed in the server

For information concerning the standard Integrated Remote Console, refer to the *Integrated Remote Console User Guide* included in the shipping box.

Security Features

Security features are as follows:

- Keyboard Password
- Administrator Password
- Network Server Mode
- QuickLock

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- Diskette Drive Control
- Diskette Write Control
- Diskette Boot Override
- Serial Interface Control
- Parallel Interface Control
- Configuration Lock
- Security Lock Provision

These security features are established through the Compaq System Configuration Utility. For information concerning server security features, refer to the Systems Reference Library CD and the SmartStart CD included in the shipping box.

Diagnostic Tools

The software and firmware diagnostic tools available for your use are:

- Power-On Self-Test (POST)
- Diagnostics (DIAGS)
- ROMPaq utilities to upgrade flash ROMs
- Automatic Server Recovery (ASR-2)

For information concerning Compaq diagnostic tools, refer to the Systems Reference Library CD included in the Reference Information pack of the shipping box.

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Chapter 3
Overview of Installing ProLiant 2500 Server and Hardware Options

The following instructions are provided as only an overview for the first-time installation and hardware option upgrades. Compaq recommends that you use the installation documentation that came with the hardware option for complete installation instructions. You may also want to refer to the *Compaq ProLiant 2500 and 2500R Hardware Installation and Configuration* poster included in the shipping box or to the hood labels attached to the inside of the Side Access Panel and the Top Access Panel. If you have any problems, contact your Authorized Compaq Reseller.

Installing the Server

The following sequence should be performed when installing your ProLiant 2500 server for the first time.

1. **Select a site and unpack the server, keyboard, mouse, and monitor** (monitor not supplied).
2. **Order SmartStart Activation Keys if purchasing operating system from Compaq.** Optional. For ordering information, refer to the Server Setup and Management pack shipped with your server.
3. **Install any PCI and EISA expansion boards.**
4. **Connect cables:** keyboard, mouse, monitor, network, and power.
5. **Install other options:** additional memory, hard drives, expansion boards, and external storage devices. You will need to run the System Configuration Utility after you install hardware options with the exception of additional memory and most PCI boards. The System Configuration utility is run during the SmartStart portion of the installation sequence. See step 7. Refer to the Server Setup and Management pack shipped with your server.

   NOTE: ISA expansion boards are installed after System Configuration utility has been run.

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6. **Set switches:** processor board switches, system board switches, and SCSI ID settings, if changes are made.
7. **Turn on the computer and insert the SmartStart CD to configure the server.** For SmartStart CD initialization procedures, refer to the Server Setup and Management pack shipped with your server.
8. **Install Compaq Insight Manager to manage the server.** For Compaq Management CD initialization procedures, refer to the Server Setup and Management pack shipped with your server.
9. **Register your server.** For server registration information, refer to the Server Setup and Management pack shipped with your server.

NOTE: When the server boots from the SmartStart program, it will automatically start the System Configuration utility. When the utility is completed, you will be prompted to turn the server off, install any ISA boards (any switch settings required will be provided by the System Configuration utility), and then boot the server again from the SmartStart program.

Selecting a Site

Ensure that the installation site you select has the following features:

- Sturdy, level installation site that includes dedicated and properly grounded circuits, air conditioning, and static electricity protection
- 3-inch (7.6-cm) clearance at front and back of server for proper ventilation
- Separate electrical circuit for the server

WARNING: This equipment is designed for connection to a grounded AC outlet. The grounding type plug is an important safety feature. To avoid risk of electric shock or damage to your equipment, do not disable this feature.

CAUTION: Ensure that the power outlet you plug your power cord into is easily accessible and is located as close to the equipment operator as possible. When you need to disconnect power from the equipment, be sure to unplug the power cord from the power outlet.

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CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

Unpacking

Unpack the server, keyboard, and cables following the instructions and illustrations printed on the shipping carton(s).

Locating Materials

Locate the following materials that were shipped with your new server:

- ProLiant 2500 Server
- Keyboard
- Mouse
- Power cord
- Documentation Inside the Server (Most of the option installation and setup instructions are located on the hood labels, which are attached to the inside of the Side Access Panel and the Top Access Panel.)
- Hardware Documentation and Software Packs Inside the Shipping Box:
  - *Server Setup and Management*
  - *Reference Information*
  - *Software Products*

In addition to these supplied items, you may need:

- T-15 Torx screw driver
- Options to be installed such as expansion boards, monitors, uninterruptible power supply (UPS), or memory
- Application software diskettes

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Ordering Activation Keys

If you are purchasing your operating system from Compaq, you may want to order the SmartStart Activation Keys (code) now so that you will have the appropriate code to unlock operating system software on the Microsoft Windows NT, NetWare, OS/2, UnixWare, or SCO OpenServer CDs. Refer to the Server Setup and Management pack shipped with your server.

Installing Hardware Options

For complete installation instructions, refer to the installation documentation that came with the option kit. For an illustration overview of installing many Compaq option upgrades, refer to the *Hardware Installation and Configuration* poster included in the shipping box, the Processor Board Hood Label located on the inside of the Side Access Panel, or the Expansion Board Hood Label located on the inside of the Top Access Panel.

The Compaq 2500's new server chassis facilitates the installation of hardware upgrades. Most hardware options are installed on the system board, on the processor board, and in the drive bay area.

To Gain Access To:	You Will Need To:
System board	Open the Front Bezel and remove the Top Access Panel
Expansion slots	Open the Front Bezel and remove the Top Access Panel
Side of media drive bays	Open the Front Bezel and remove the Side Access Panel
Front of media drive bays	Open the Front Bezel
Processor (CPU) and memory	Remove the processor board tray
Processor board	Remove the processor board tray

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

WARNING: To avoid the risk of injury or damage to the equipment when installing options, ensure that the power to the server is turned off and that the AC power cord is disconnected.

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CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure. Refer to Appendix A, "Electrostatic Discharge," for more information.

Opening the Front Bezel

To open the Front Bezel:

1. If the keylock is locked, turn the keylock.
2. Open the Front Bezel (front door) to the right.

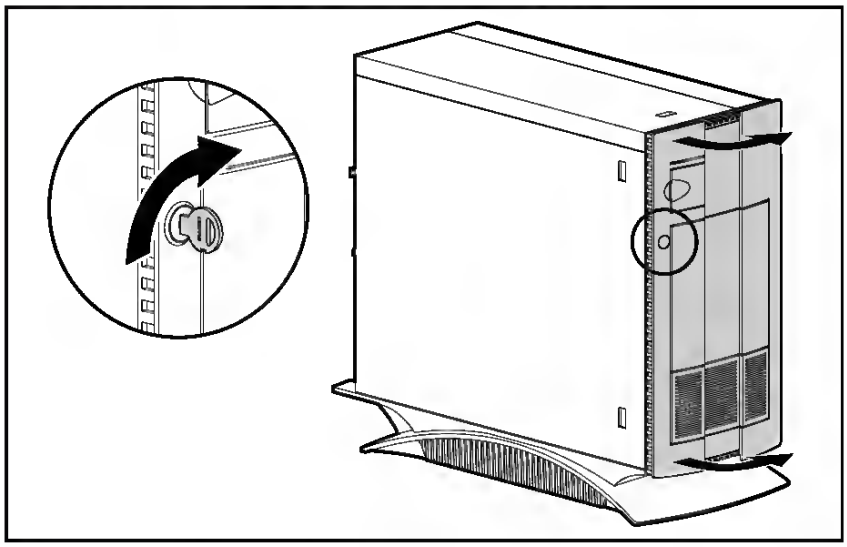

Figure 3-1. Opening the Front Bezel

Removing Top Access Panel to Locate System Board, Expansion Slots, and Hood Labels

To remove the Top Access Panel:

1. If the computer is on, turn it off and disconnect the power cord.
2. Disconnect any other external equipment connected to the computer.
3. Open the Front Bezel.

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4. Loosen the top thumbscrew.
5. Slide the Top Access Panel toward the rear of the unit about 0.5 inch (1.5 cm), and then slide the panel to the side of the server. See Figure 3-2.
6. Lift and remove the panel.

CAUTION: Do not operate the server with the Top Access Panel removed. The Top Access Panel is an integral part of the cooling system and removing it while the system is running may adversely affect data integrity.

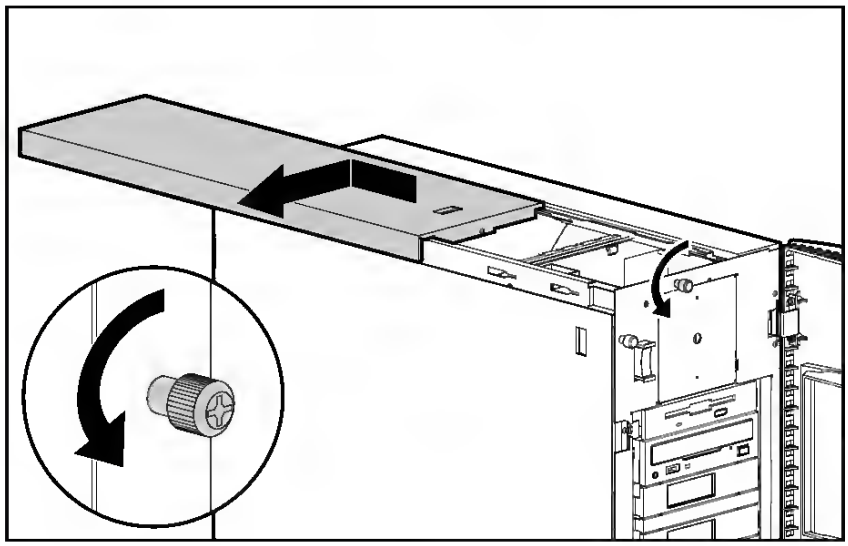

Figure 3-2. Sliding the Top Access Panel

7. Turn the Top Access Panel over to locate the System Board Hood Label and the Expansion Board Hood Label.

   NOTE: These hood labels provide instructions on installing expansion boards and setting system board switches.

8. Set the panel to the side, and locate the system board and expansion slots inside the chassis.

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Removing Side Access Panel to Locate Internal Wiring and Hood Labels

To remove the Side Access Panel:

1. If the computer is on, turn it off and disconnect the power cord.
2. Disconnect any other external equipment connected to the computer.
3. Open the Front Bezel.
4. Loosen the two thumbscrews located on the left side of the front chassis.
5. Slide the Side Access Panel toward the rear of the unit 0.5 inch (1.5 cm).
6. Lift and remove the panel.

CAUTION: Do not operate the server with the Side Access Panel removed. The Side Access Panel is an integral part of the cooling system and removing it while the system is running may adversely affect data integrity.

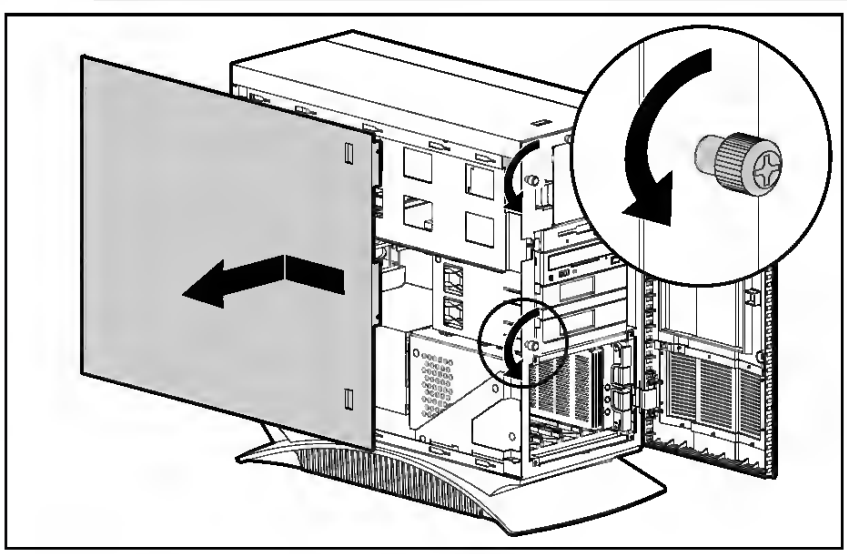

Figure 3-3. Removing the Side Access Panel

7. Turn the Side Access Panel over to locate the Processor Board and the Drive Configuration Hood Labels.

NOTE: These labels provide information on installing processor board options, configuring drives, installing drives, and setting switches.

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Removing and Replacing the Processor Board Tray

The processor board tray holds the processor board and its components: memory, switches, and connectors. To remove the processor board tray and locate the processor board:

1. If the computer is on, turn it off and disconnect the power cord.
2. Disconnect any other external equipment connected to the processor board tray. (Refer to figure below.)

CAUTION: If a security screw is installed in the side of the processor board tray, remove the screw before opening the tray.

CAUTION: To prevent damage to internal wiring, contact your Authorized Compaq Reseller before using the system board ejector lever.

3. Open the processor board tray.

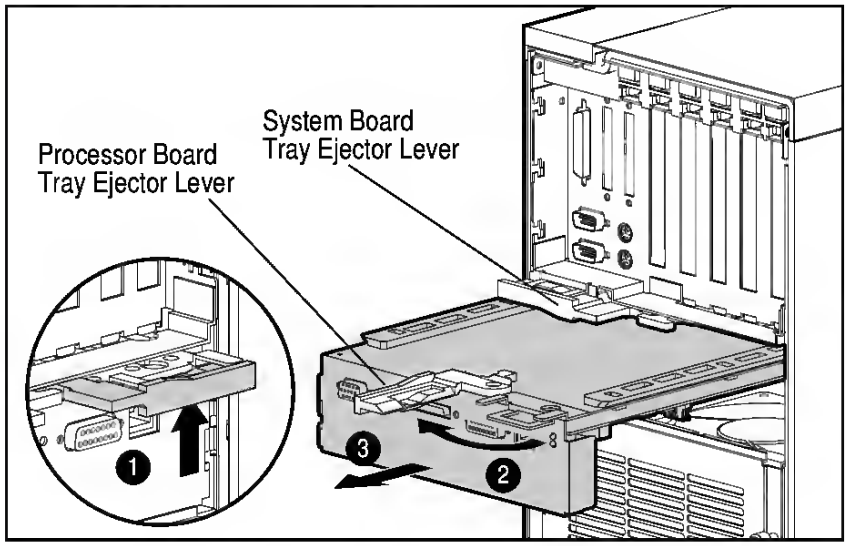

Figure 3-4. Removing the Processor Board Tray

4. Remove the tray and turn the tray over to locate the processor board and its components: processor, memory, switches, and connectors.

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5. For installation of these components, refer to the *Hardware Installation and Configuration Poster* included in the shipping box or to the Processor Board Hood Label located on the inside of the Side Access Panel.

6. To reassemble the server, reverse steps 1 through 4.

NOTE: If you have inadvertently removed the processor board tray without turning OFF the power switch, the server will automatically power down. This is not, however, a recommended procedure for powering off the server.

Installing Security Provisions

The ProLiant 2500 is equipped with four unique security access provisions: one keylock for the Front Bezel and one locking screw each for the system board tray, the processor board tray, and the fan door.

1. If the computer is on, turn it off and disconnect the power cord.

2. Disconnect any other external equipment connected to the computer.

3. Remove the Side Access Panel.

CAUTION: Do not operate the server with the Side Access Panel removed. The Side Access Panel is an integral part of the cooling system and removing it while the system is running may adversely affect data integrity.

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4. To secure the system board tray, processor board tray, and fan door; remove the three security screws located at the front of the side chassis.

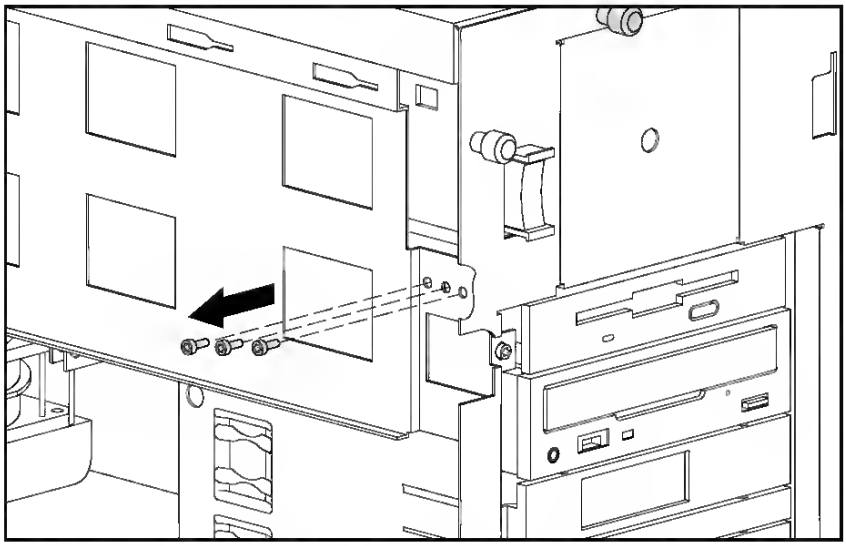

Figure 3-5. Removing Three Security Screws from Front Left Side of Chassis

5. Reinstall the screws at the rear of the chassis.

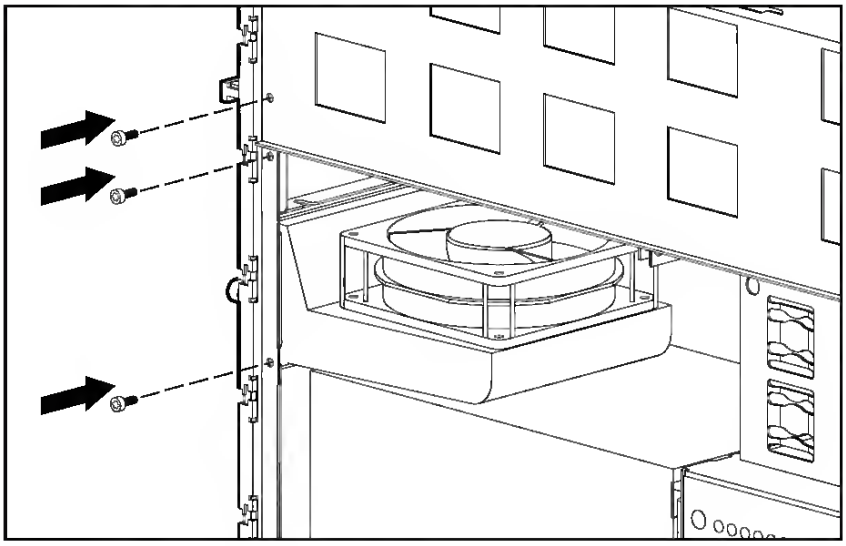

Figure 3-6. Installing Three Security Screws

6. Replace the Side Access Panel.

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7. Close the Front Bezel and turn the keylock to lock the bezel.

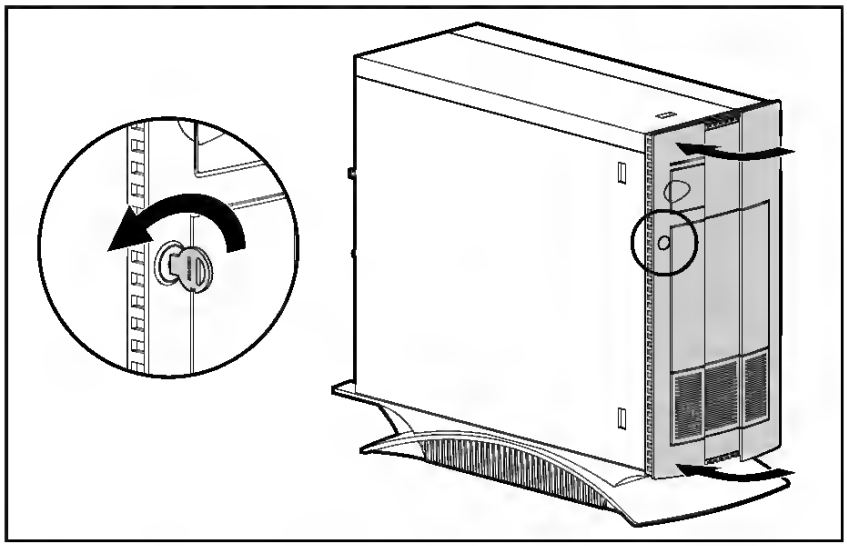

Figure 3-7. Securing Front Bezel with Keylock

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Locating the Expansion Slot Locations

The ProLiant 2500 server system board has six expansion slots that are located directly beneath the Top Access Panel:

- Four shared PCI/EISA expansion slots (slots 1 - 4)
- Two dedicated PCI local bus expansion slot (slots 5 and 6)

NOTE: Although there are two physical connectors (one EISA and one PCI) for each shared PCI/EISA slot, the connectors are placed so that only one of the connector slots can have a board installed at a time.

Expansion boards can be installed in the following expansion board slot locations:

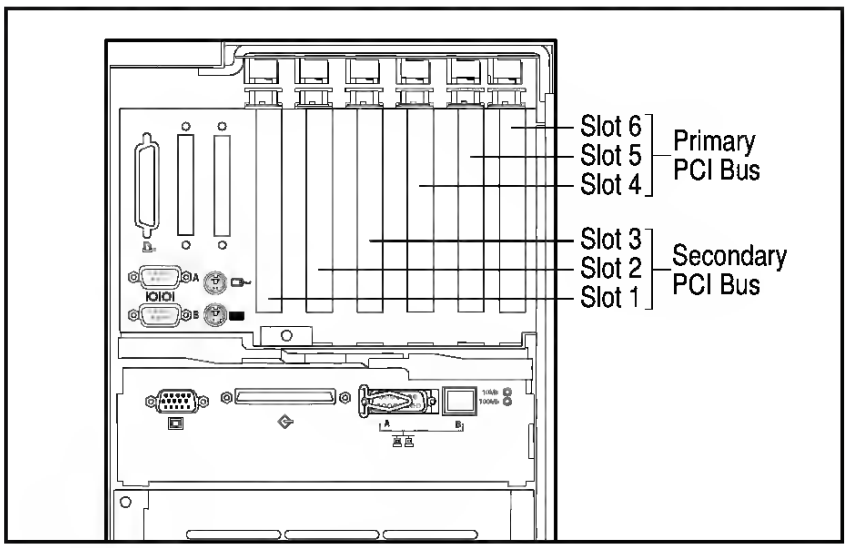

Figure 3-8. Location of Expansion Slots

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Installing an Expansion Board

To install an expansion board, refer to one of the following installation sources:

- For a text and illustration procedure, refer to the installation documentation that came with the option kit.
- For a text only overview of the procedure, refer to the procedure below.
- For an illustration overview of the procedure, refer to the *Hardware Installation and Configuration* poster included in the shipping box or to the Expansion Board Installation Hood Label located on the inside of the Side Access Panel.

1. If the computer is on, turn it off and disconnect the power cord.
2. Disconnect any other external equipment connected to the computer.
3. Remove the Top Access Panel.
4. Press on the top ❶ of the expansion slot latch and open the latch toward the rear ❷ of the expansion slot cage.
5. Remove the expansion slot cover ❸.

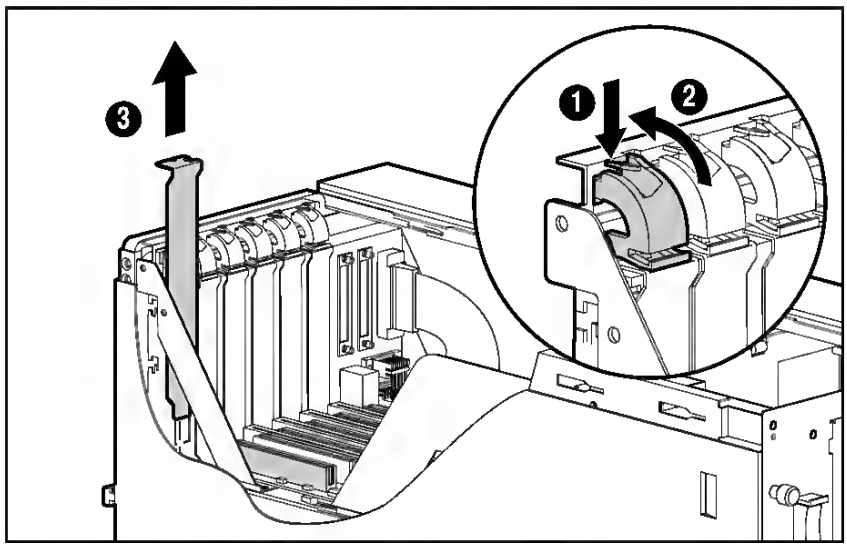

Figure 3-9. Opening Expansion Slot Latch and Removing Slot Cover

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6. Insert the expansion board.

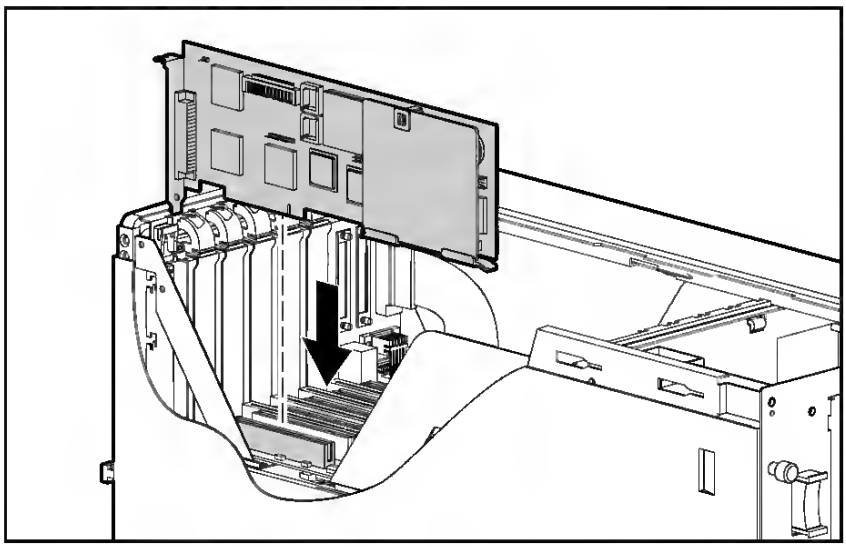

Figure 3-10. Inserting Expansion Board

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7. Close the expansion slot latch to secure the board.

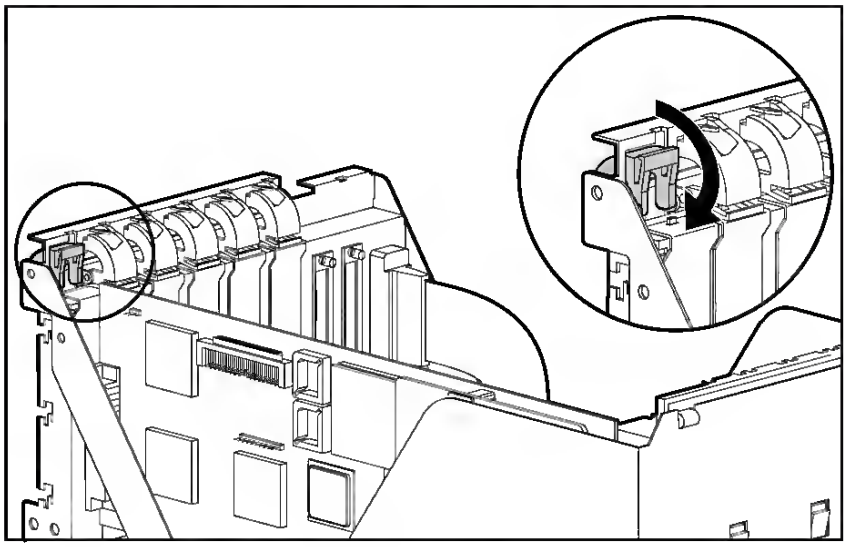

Figure 3-11. Securing Expansion Board

8. Close up the server.
9. Reconnect any external peripherals and the power cord.
10. Turn on the computer.
11. Run the Compaq System Configuration utility, if necessary.

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Installing More Pentium Pro Memory

You can expand computer memory by installing industry standard Dual Inline Memory Modules (DIMMs) on the processor board of the Pentium Pro system. The following guidelines must be followed when installing additional memory:

- Use only 32-MB, 64-MB, 128-MB, or 256-MB; EDO- or FASTPAGE-buffered; 4-K refreshed DIMMs.
- DIMMs must be 60 ns or faster.

CAUTION: Use only Compaq DIMMs. DIMMs from other sources may adversely affect data integrity. Power-On Self-Test (POST) will warn of non-supported DIMMs.

To install more memory, refer to one of the following installation sources:

- For a text and illustration procedure, refer to the installation documentation that came with the option kit.
- For a text only overview of the procedure, refer to the procedure below.
- For an illustration overview of the procedure, refer to the *Hardware Installation and Configuration* poster included in the shipping box or to the Processor Board Hood Label located on the inside of the Side Access Panel.

To install a Compaq DIMM, complete the following steps:

1. If the computer is on, turn it off and disconnect the power cord.
2. Disconnect any other external equipment connected to the computer.
3. Remove the processor board tray.
4. Place the processor board tray, component side up, on a flat surface.
5. Align the key slot on the bottom edge of each DIMM with the tab in the DIMM socket.

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6. Open the DIMM socket latches ❶.

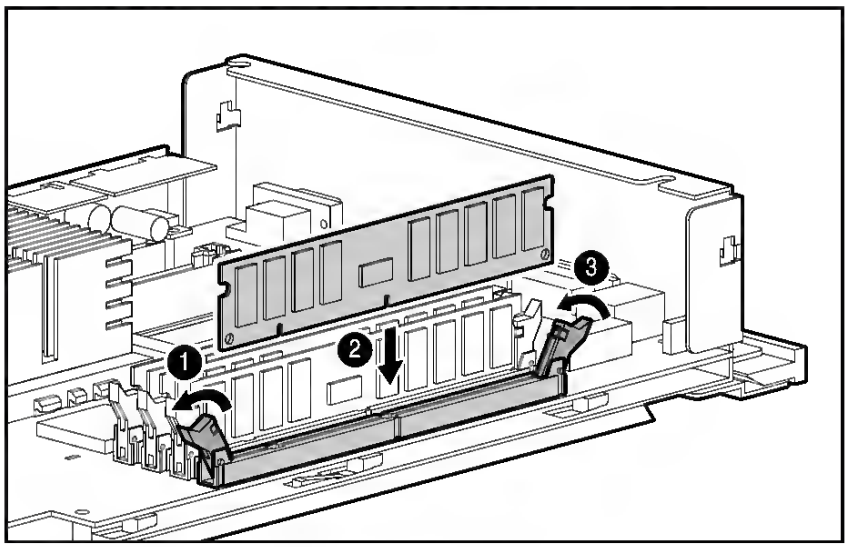

Figure 3-12. Installing DIMM Memory Modules

7. Insert each DIMM ❷ directly into the socket.

   NOTE: A memory module can only be installed in one way. Match the notch on the module with the tab on the memory socket. Push the module down into the socket, ensuring that the module is fully inserted and properly seated.

8. Close the DIMM socket latches. ❸
9. Reinstall the processor board tray.
10. Reconnect any external peripherals and the power cord.
11. Turn on the computer.

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Installing Additional Mass Storage Devices

Hot-pluggable server models have a total of seven drive bays for installing additional internal mass storage devices. SCSI devices such as diskette, tape, or hard drives can be installed in the vacant non-hot-pluggable, removable media drive bays (SCSI IDs 5 and 6). One-inch or 1.6-inch SCSI hard drives can be installed in the hot-pluggable drive cage (SCSI IDs 0 - 4). The drive cage is capable of configuring a maximum of:

- Five I-inch hard drives *or*
- Two I.6-inch hard drives and one 1-inch hard drive

The figure below shows five 1-inch hard drives installed in the hot-pluggable drive cage.

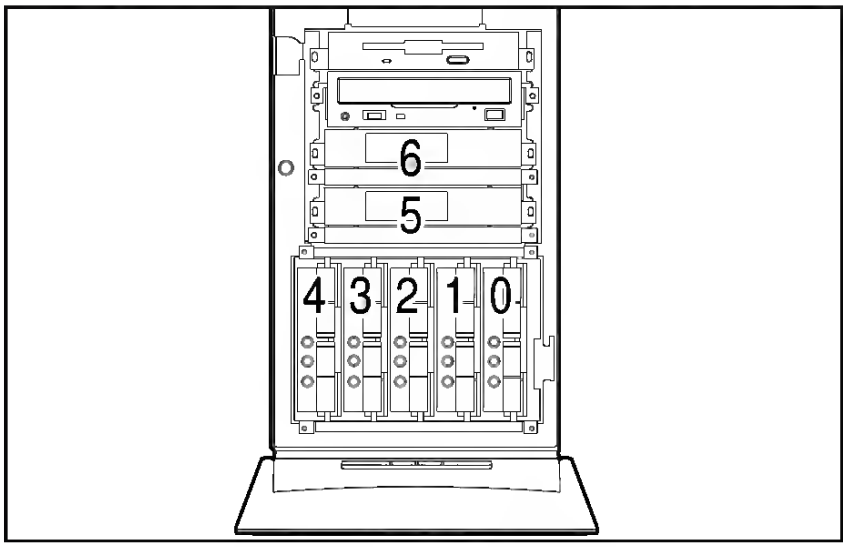

Figure 3-13. SCSI IDs Locations for Hot-Pluggable Models (SCSI IDs 5 and 6 are non-hot-pluggable.)

SCSI hard drives on the Integrated Wide-Ultra SCSI Controller on the PCI Bus must be either internal or in an external storage system, but not both.

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Non-hot-pluggable models have a total of six non-hot-pluggable drive bays for installing additional internal mass storage devices. SCSI devices such as diskette, tape, or hard drives can be installed in the vacant removable media drive bays (SCSI IDs 4 and 5). Non-hot-pluggable models have a drive cage (SCSI IDs 0 - 3) capable of configuring a maximum of four 1.6-inch hard drives.

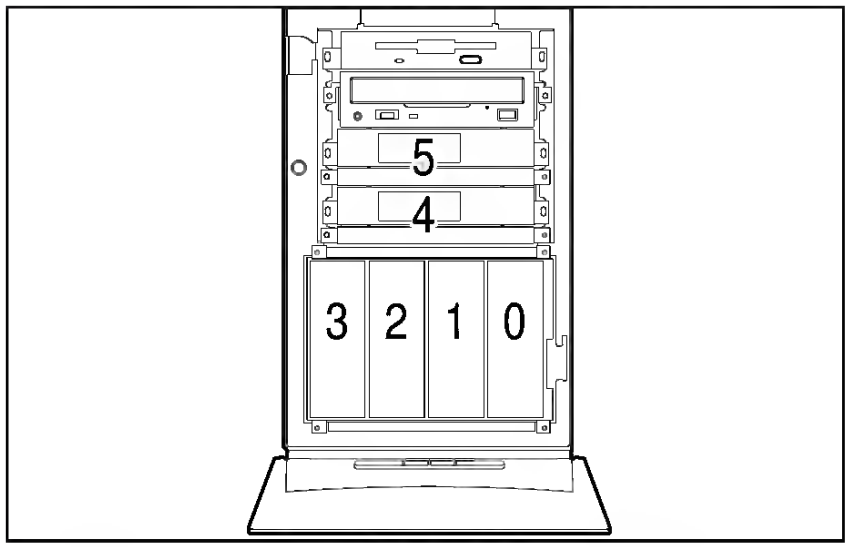

Figure 3-14. SCSI ID Locations for Non-Hot-Pluggable Models (SCSI IDs 4 and 5 are non-hot-pluggable.)

SCSI hard drives on the Integrated Wide-Ultra SCSI Controller on the PCI Bus must be either internal or in an external storage system, but not both.

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Removable Media Drive Bays

All ProLiant 2500 models ship standard with four non-hot-pluggable, removable media drive bays. The top two bays are occupied with a 3.5-inch diskette drive and an IDE CD-ROM drive; the bottom two half-height 5.25-inch bays are vacant.

Two half-height removable storage devices such as tape or hard drives can be installed in the bottom two removable media drive bays. Also, one full-height storage device such as a DLT tape drive can be installed in the area occupied by the bottom removable media drive bays. To install a device in this area and to cable the device, refer to the installation documentation that came with the drive. The illustrations below provide only an overview of removing the blank panel and inserting a storage device.

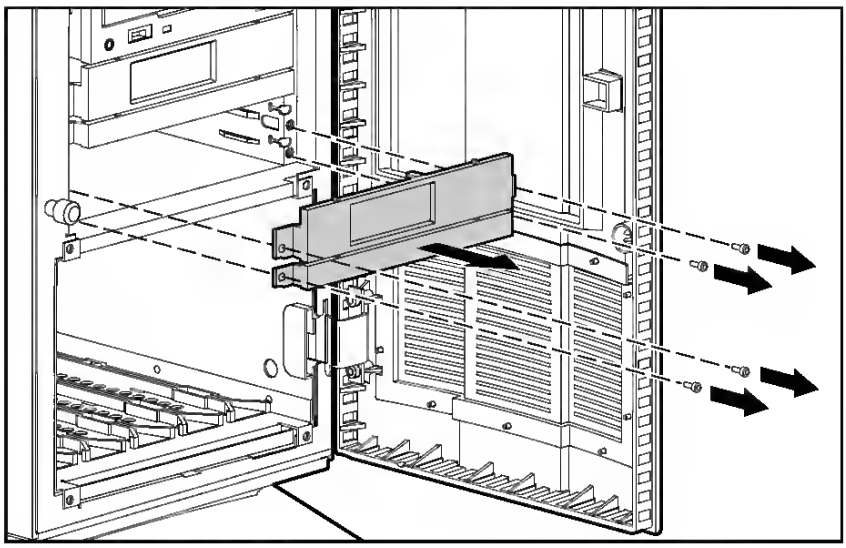

Figure 3-15. Removing Blank Panel

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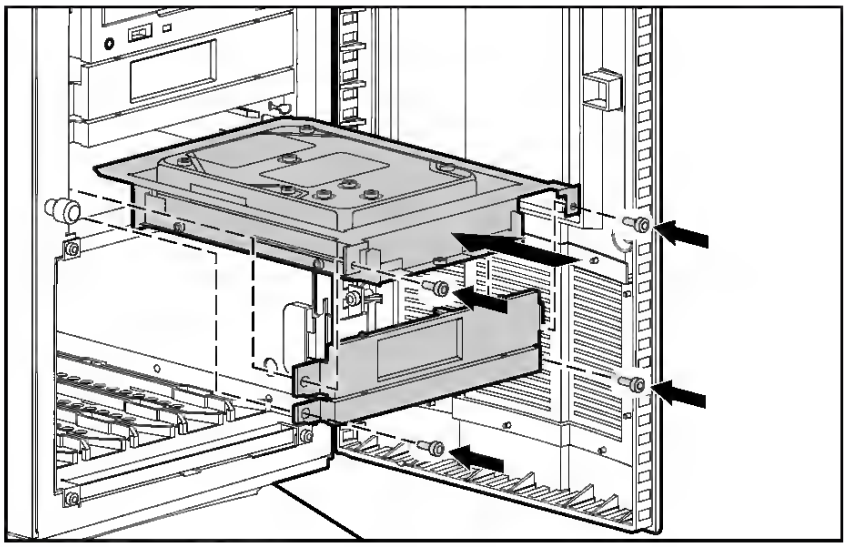

Figure 3-16. Installing Hard Drive and Blank Panel

Drive Installation Guidelines

The following guidelines should be noted when adding SCSI hard drives:

- A maximum of five SCSI devices may be added per controller.
- The SCSI ID for each hot-pluggable hard drive is set as the bay number (Bay 0 = SCSI ID 0).
- If only one SCSI hard drive is used, it should be installed in the lowest numbered bay.
- Compaq SCSI non-hot-plug cables for the Compaq ProLiant 2500 are terminated. Be sure to remove all terminating jumpers from third-party SCSI devices.
- Run System Configuration Utility after installing a drive.
- SCSI hard drives on the Integrated Wide-Ultra SCSI Controller on the PCI Bus must be either internal or in an external storage system, but not both.

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Installing Hard Drives in the Hot-Pluggable Drive Cage

To install a hot-pluggable hard drive, first review the installation documentation that came with the drive. The following illustrations provide only an overview of a hard drive installation.

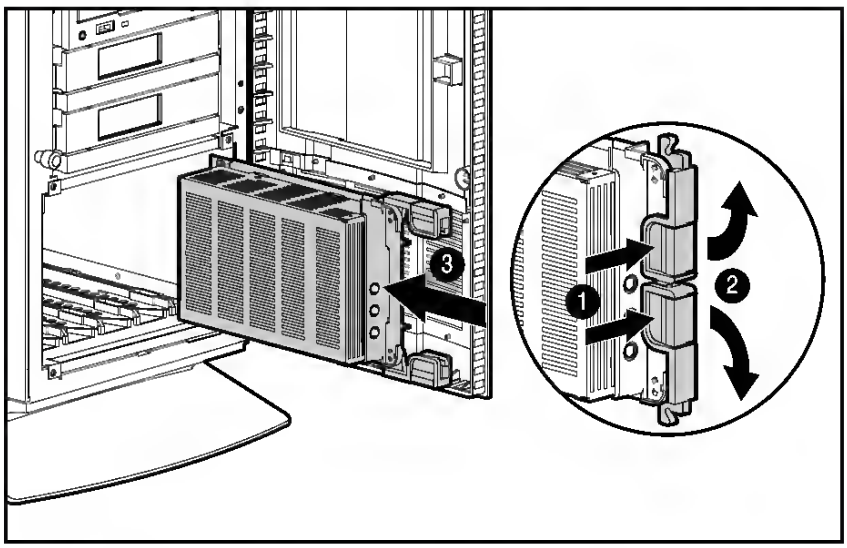

Figure 3-17. Opening Ejector Levers and Inserting Hard Drive

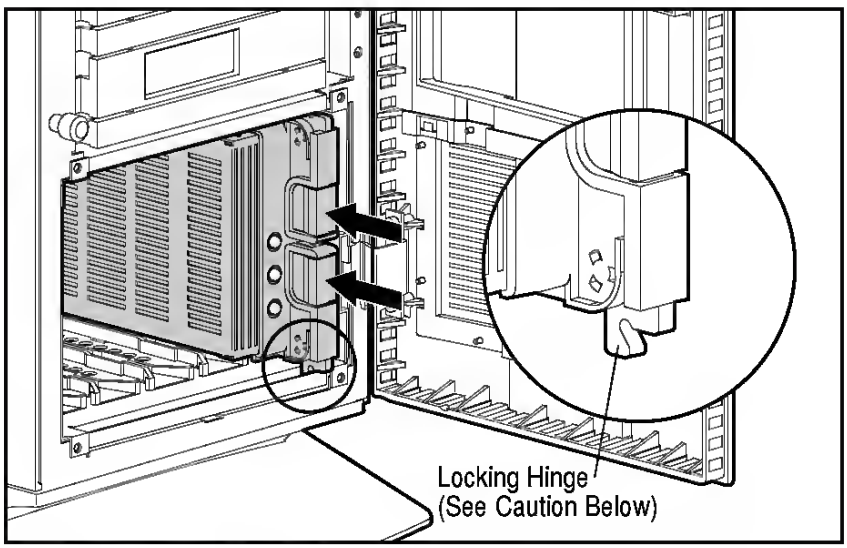

Figure 3-18. Closing Ejector Levers to Secure Hard Drive in Drive Cage

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CAUTION: To ensure the hard drive is fully seated in the drive cage slot, the locking hinge of the ejector lever must latch behind the front panel of unit. If this procedure is not followed, the server will not recognize the hard drive.

Installing Hard Drives in the Non-Hot-Pluggable Drive Cage

To install a non-hot-pluggable hard drive, refer to the installation documentation that came with the drive. The following illustration and steps provide only an overview of this installation.

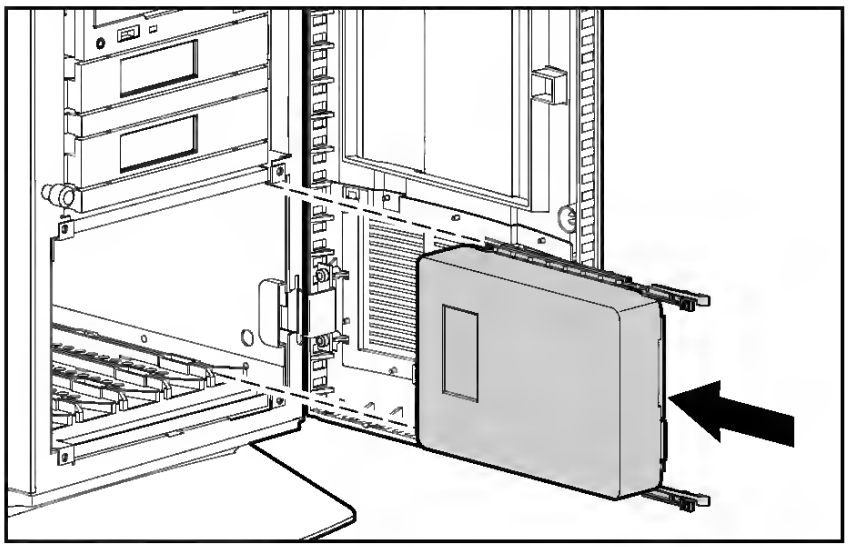

Figure 3-19. Installing Non-Hot-Pluggable Hard Drive

1. Connect the signal and power cables.
2. Set the jumper and SCSI IDs.

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Installing External Storage Devices

Optional mass storage devices can be connected to the Compaq ProLiant 2500 by using the Wide-Ultra SCSI connector on the back of the unit, or the SCSI ports on the optional Wide-Ultra SCSI Controllers installed.

To install this option, refer to the installation documentation that came with the external storage device. The following illustration provides only an overview of this installation.

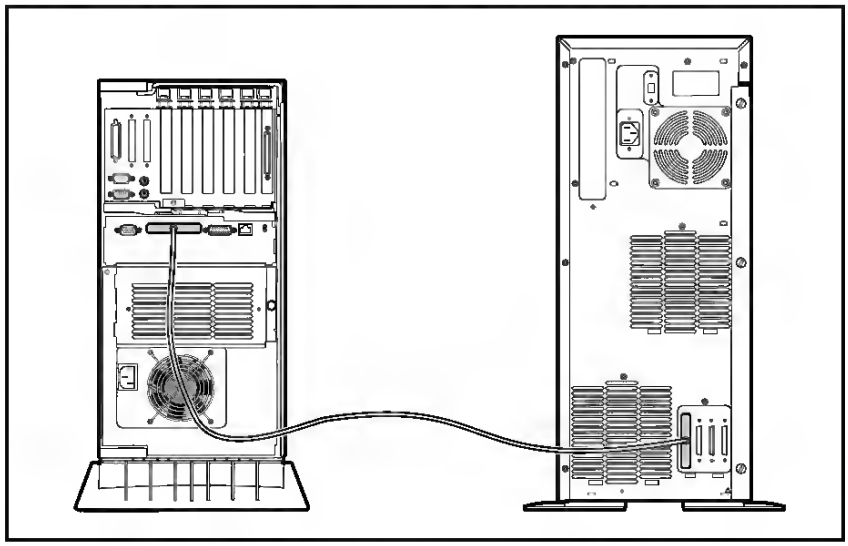

Figure 3-20. Connecting External Mass Storage Devices

Setting System Board and Processor Board Switches

To set system board and processor board switch settings, refer to one or more of the following documents:

- *Hardware Installation and Configuration* poster shipped in the Reference Information pack.
- Processor Board Hood Label located on the inside of the Side Access Panel
- System Board Hood Label located on the inside of the Top Access Panel

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Installing a Processor (CPU)

To install a processor in the processor board, refer to one of the following installation sources:

- For a text and illustration procedure, refer to the installation documentation that came with the option kit.
- For a text only overview of the procedure, refer to the procedure below.
- For an illustration overview of the procedure, refer to the *Hardware Installation and Configuration* poster included in the shipping box or to the Processor Board Hood Label located on the inside of the Side Access Panel.

The processor installation procedure below is text only. To install a processor:

1. If the computer is on, turn it off and disconnect the power cord.
2. Disconnect any other external equipment connected to the computer.
3. Remove the processor board tray.
4. Place the processor board tray, component side up, on a flat surface.
5. Install the new processor using the instructions provided with the processor option kit or with the Processor Board Hood Label attached to the inside of the Side Access Panel.
6. Reinstall the processor board tray.
7. Reconnect any external peripherals and the power cord.
8. Turn on the computer.

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Connecting the Power Cord and Peripheral Devices

After all internal options have been installed and the Top and Side Access Panels have been replaced, connect the power cord and peripheral devices such as the keyboard, mouse, and monitor. Icons on the back of the server identify the function of each connector.

WARNING: To reduce the risk of electrical shock or fire, do not plug telecommunications/telephone connectors into the Network Interface Card (NIC) receptacles.

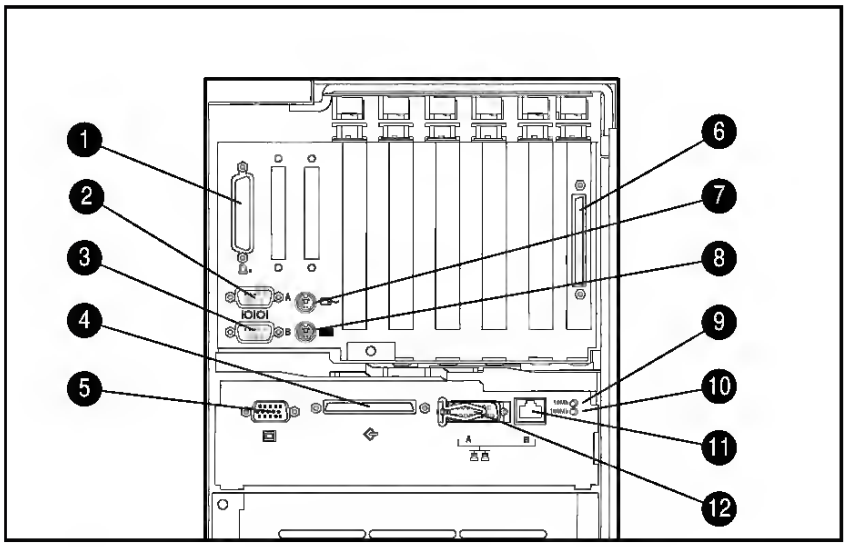

Figure 3-21. Location of Rear Panel Connectors and LEDs

Ref.	Connector or LED	Ref.	Connector or LED
1	Parallel Connector	7	Mouse Connector
2	Serial Connector	8	Keyboard Connector (hot-pluggable)
3	Serial Connector	9	10 Mb/s LED
4	SCSI Connector	10	100 Mb/s LED
5	Video Connector	11	RJ-45 Ethernet Connector
6	SCSI port (SCSI Array)	12	AUI Ethernet Connector

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Powering Up the Server

After the cables have been connected and the panels have been replaced and secured with the thumbscrews, you are ready to power up the server.

CAUTION: Be sure that the power outlet you plug your power cord into is easily accessible and located as close to the equipment operator as possible. When you need to disconnect power to the equipment, be sure to unplug the power cord from the power outlet.

NOTE: Do not place anything on power cords or cables. Arrange them so that no one may accidentally step or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

1. Slide the power switch cover plate ❶ top the right.
2. Press the power switch ❷.

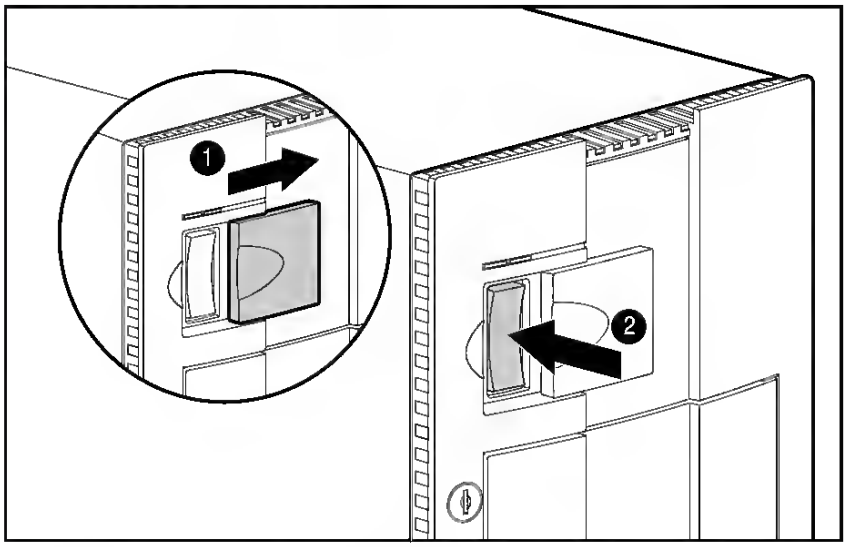

Figure 3-22. Turning on Power to Server

The server is now ready to be configured with the SmartStart CD.

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Configuring the Server with SmartStart

SmartStart is the intelligent way to configure the server and to load the system software and to configure the server, thereby achieving a well-integrated server to ensure maximum dependability and supportability. The SmartStart CD holds the Compaq System Configuration Utility and ROMPaq. To use the SmartStart CD, refer to the Server Setup and Management pack included in the shipping box.

The Compaq System Configuration utility performs a wide range of configuration activities including the following:

- Configures EISA and PCI boards automatically
- Provides switch and jumper settings
- Resolves resource conflicts in areas such as memory, port addresses, and interrupts (IRQs)
- Manages the installation of memory, processor upgrades, and mass storage devices such as hard drives, tape drives, and diskette drives
- Sets and stores power-on features like date and time
- Stores configuration information in nonvolatile memory
- Assists in the installation of the operating system
- Assists in running diagnostic tools such as TEST and INSPECT Utilities

The first time the server is configured, the SmartStart program automatically creates a system partition and installs the configuration utility and other Compaq utilities in that partition.

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To install the SmartStart CD:

1. With your computer turned on, open the removable media access door by pressing on the left side of the door ❶. Fully open the door ❷ to access the CD-ROM drive.

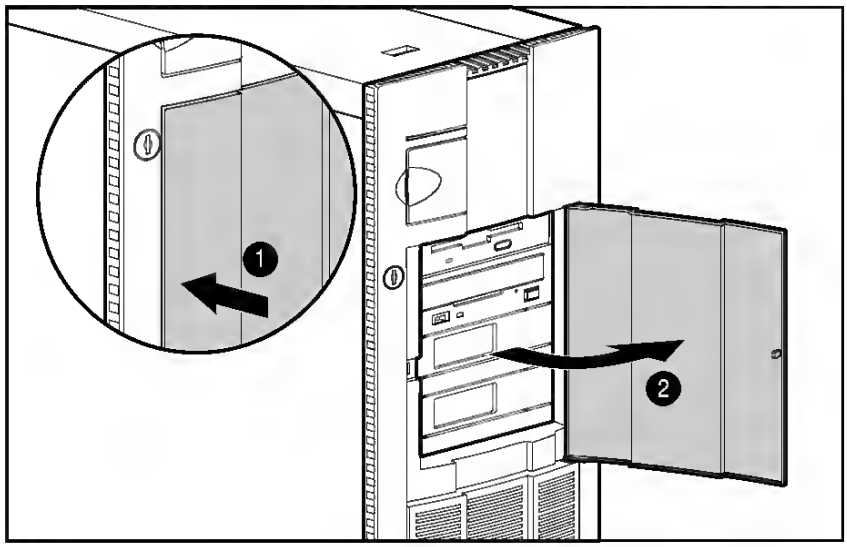

Figure 3-23. Opening the Removable Media Access Door

2. Open the CD-ROM tray by pressing the load/unload button on the front panel of the drive. Refer to Appendix E, "Using the Internal CD-ROM Drive," for CD-ROM drive user instructions.

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3. Place the SmartStart CD ❶ in the tray, handling the CD from the edges, not the flat surfaces of the disc.

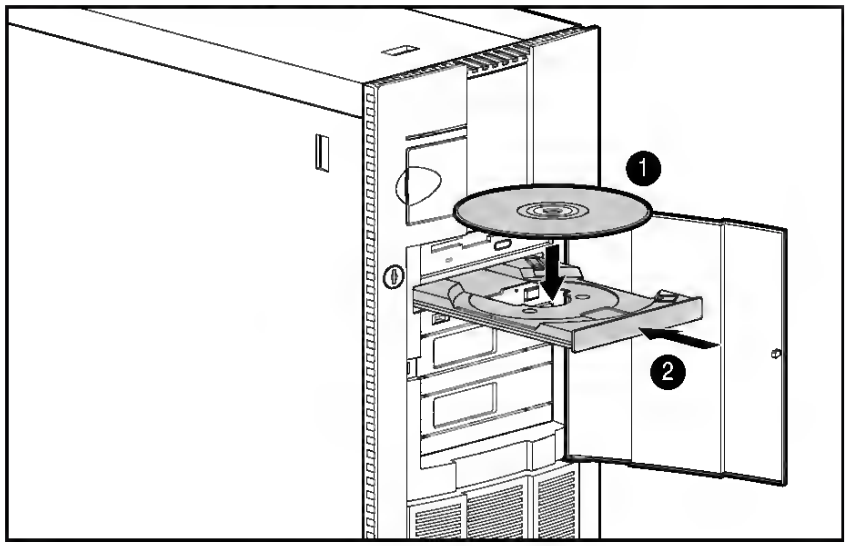

Figure 3-24. Opening the Internal CD-ROM Tray

4. Close the tray by again pressing the load/unload button ❷.
5. When the busy indicator turns green, the drive is ready to receive commands and data may be retrieved from the disc.

Using Diagnostics Tools

The software and firmware diagnostic tools available for your use are:

- Power-On Self-Test (POST)
- Diagnostics (DIAGS)
- ROMPaq utilities to upgrade flash ROMs
- Automatic Server Recovery (ASR-2)

For information concerning Compaq diagnostic tools, refer to the Systems Reference Library CD included in the Reference Information pack of the shipping box.

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Registering Your Server

You may register your server when you order the Activation Keys or during the "Product Interviews" stage of the SmartStart configuration process. Refer to the Server Setup and Management pack included in the shipping box.

Routine Maintenance

For information concerning routine maintenance and safety precautions, refer to the Systems Reference Library CD included in the Reference Information pack of the shipping box.

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Chapter 4
Overview of Installing ProLiant 2500R Server and Hardware Options

This chapter covers the following information about your new ProLiant 2500R server:

- How to attach the mounting hardware to the server and to the rack
- How to install the server into the rack
- How to cable the server
- How to access the internal components of the rack-mounted server

You may choose Compaq's optional installation service to install your rack products. See "Optional Installation Service" at the end of this chapter.

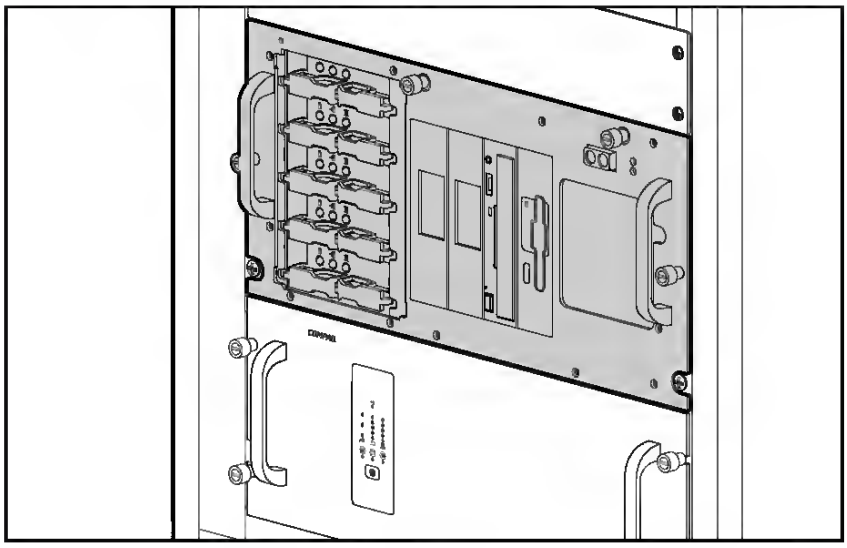

Figure 4-1. ProLiant 2500R installed in rack

For more information about Compaq rack-mountable products, refer to the following Compaq documentation included with the server:

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- *Rack Planning and Installation Guide*

  This guide provides you with complete details on Compaq racks and rack-mountable products.

- *Rack Builder* diskette

  This program allows you to build an online version of your proposed rack configurations. You can add icons of the rack model server and other rack-mount components to a graphic of the rack you intend to use. You can print reports of your simulations that include a list of all the Compaq parts and part numbers that are required for complete installation.

- *Rack-Mountable Compaq ProLiant Server Installation Video*

  This video is about thirty minutes long and contains handy tips and tricks to help you efficiently and safely install your rack-mountable products.

Rack Warnings and Precautions

WARNING: To avoid the risk of personal injury or damage to the equipment, at least two people are needed to safely unload the rack from the pallet. An empty 42U rack weighs 253 lb (115 kg), is over seven ft (2.1m) tall, and may become unstable when being moved on its casters. Do not stand in front of the rack as it rolls down the ramp from the pallet, but handle it from the sides.

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WARNING: A rack may become unstable if more than one component is extended for any reason. To reduce the risk of personal injury, always ensure that the rack is adequately stabilized before extending a component outside the rack, and extend only one component at a time.

WARNING: Before beginning to work on the rack, be sure that the leveling jacks are extended to the floor, that the full weight of the rack rests on the level floor, and that either stabilizers are installed or that multiple racks are coupled together for stability.

Server Warnings and Precautions

WARNING: To avoid the risk of personal injury or damage to the equipment, a minimum of two people **MUST** lift the server into the rack. The server weighs about 50 pounds (22.6 kilograms). If the unit is to be loaded above chest level, a third person must assist in aligning the rails while the other two support the unit.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the hot plug drives and internal system components to cool before touching.

WARNING: This equipment is designed for connection to a grounded AC outlet. The grounding type plug is an important safety feature. To avoid risk of electric shock or damage to your equipment, do not disable this feature.

CAUTION: Be sure that the power outlet you plug your power cord into is easily accessible and located as close as possible to the equipment operator. When you need to disconnect power to the equipment, be sure to unplug the power cord from the power outlet.

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CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

CAUTION: The Rack-Mountable Compaq ProLiant Server must always be operated with the system unit cover on. Proper cooling will not be achieved if the system unit cover is removed.

Installation Sequence

Below is a brief summary of the steps you will follow to install your rack model ProLiant 2500R server:

1. Select an appropriate site for your rack. See the *Rack Planning and Installation Guide* for site selection criteria.
2. Unpack the server and rack mounting hardware.
3. Install any EISA and/or PCI expansion boards in the server. See the options kits for detailed instructions. To make the server lighter and more manageable, do not install drives in the server until after you load the server into the rack.

   IMPORTANT: ISA expansion boards are installed after the System Configuration Utility has been run (during the SmartStart portion of the installation sequence).
4. Set switches: processor board switches, system board switches, and SCSI ID settings.
5. Attach rack mounting hardware to the rack and to the server.
6. Slide the server into the rack.

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7. Attach the cable management arm to the cable management arm bracket.
8. Attach the optional cable support to the back of the rack. The cable support is needed only if you are routing cables from one side of the rack to the other.
9. Connect cables: keyboard, mouse, monitor, network, and power cables.
10. Turn on the computer and insert the SmartStart CD to configure and manage the server. When the server boots from the SmartStart program, it automatically starts the System Configuration Utility.
11. When the System Configuration Utility is completed, turn off the server, install any other options such as additional memory, hard drives, external storage devices, and ISA boards. The System Configuration Utility provides required switch settings.
12. Order Activation Keys.
13. Register your server.

For complete details on the SmartStart program, read the SmartStart installation card included in your SmartStart package.

After the SmartStart program has finished configuring your system, you have completed the installation of your new Compaq server.

Installing Hardware Options

Refer to Chapter 3, "Overview of Installing ProLiant 2500 Server and Hardware Options," for the hardware option installation procedures.

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Unpacking the Rack Server

Unpack the server box and locate the materials and documentation necessary to install your rack-mountable server.

Locating Materials

All of the equipment needed to install the ProLiant 2500R server in the rack is included with the rack and with the server.

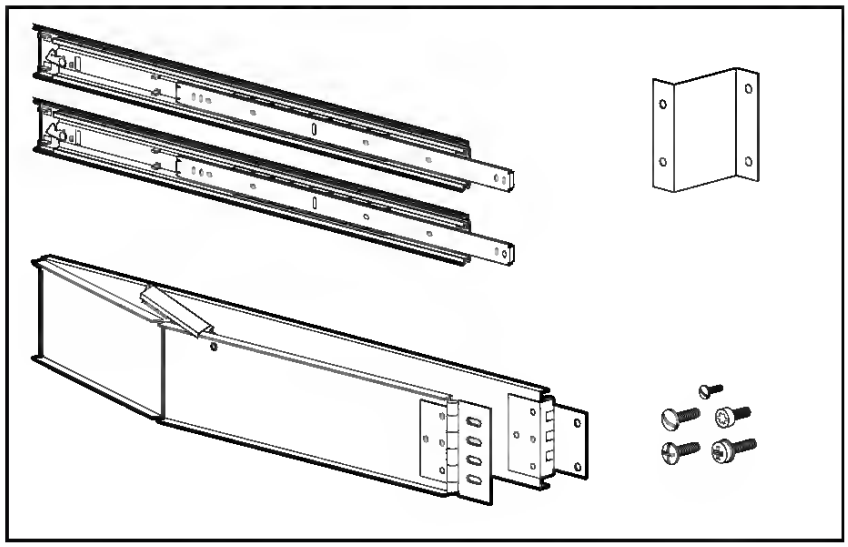

Figure 4-2. Rack mounting hardware included with the server

Contents of the rack model server box include

- Compaq ProLiant 2500R server
- Rack mounting hardware
  - One pair 22-inch slide rail assemblies
  - Cable management arm bracket

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- Cable management arm
- Cable support with ties (not shown)
- Template that can be used to mark the rack for proper attachment of the rack mounting brackets (not shown)

- Documentation and software
  - *Server Installation Guide*
  - *Quick Hardware Installation Poster*
  - *SmartStart Documentation Package*
  - *Rack Planning and Installation Guide*
  - *Rack Builder program*
  - *Rack Installation Video*
  - *CompaqCare folder*
  - *Compaq Product Quality Statements*
  - *Owner's Registration folder*

In addition to these supplied items, you may need:

- Phillips screwdriver
- Slotted screwdriver
- Application software diskettes, such as SmartStart
- Options to be installed, such as
  - Optional uninterruptible power supply (UPS)
  - Optional monitor, keyboard, etc.

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Preparing the Mounting Brackets and Slide Rail Assemblies

Each pair of mounting brackets, with attached slide rail assemblies, will support one rack-mountable server.

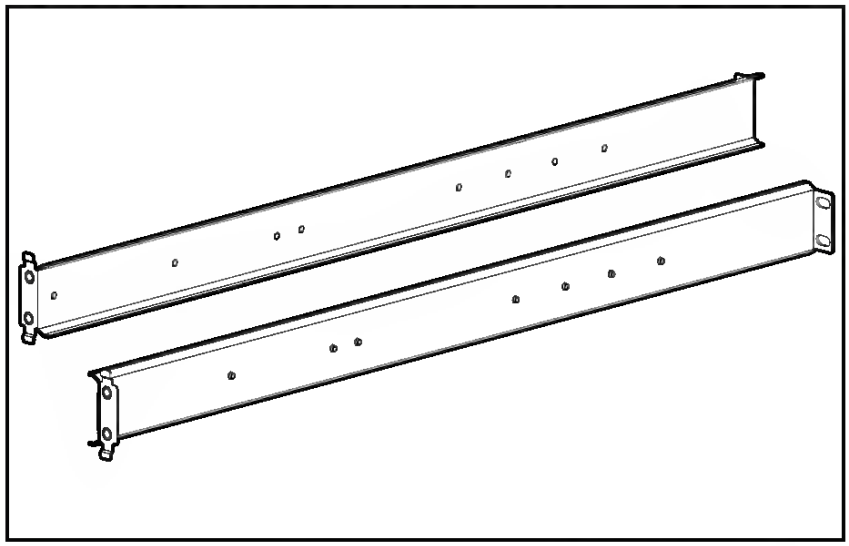

Figure 4-3. Rack mounting brackets; alignment tabs identify the front flanges

Each slide rail assembly consists of an outer bracket rail and an inner component rail (see the following figure). These pieces can be separated; the bracket rails attach to the rack mounting brackets (shown in the previous figure), and the component rails attach to the sides of the server chassis.

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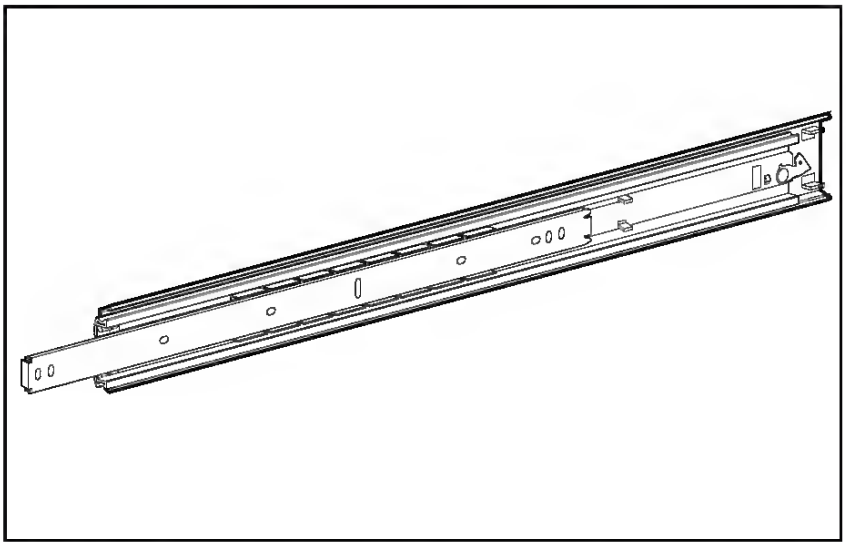

Figure 4-4. Slide rail assembly (outer bracket rail and inner component rail)

IMPORTANT: To make the installation of the mounting bracket easier, attach the bracket rail to the rack mounting bracket before attaching the mounting bracket assembly to the rack. This way, the joined mounting bracket and bracket rail can be fastened to the rack as one assembly.

Attaching the Bracket Rail to the Mounting Bracket

1. Unpack the hardware mounting kit. Lay the two-piece slide rail assembly (outer bracket rail and inner component rail) and fasteners on a flat surface along with the mounting brackets and fasteners that came with the rack.

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2. Extend the component rail from the bracket slide rail until the component rail release latch clicks. Holding down the latch, slip this piece out of each bracket rail, as shown in the following figure.

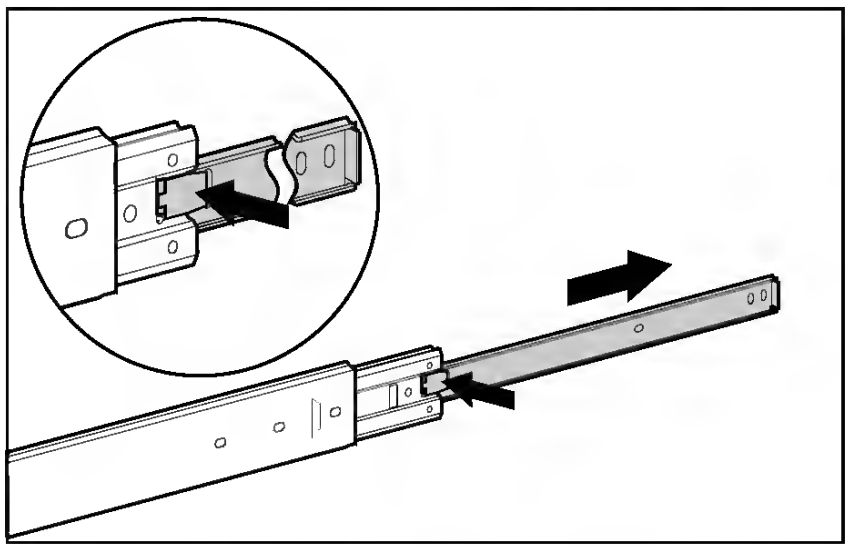

Figure 4-5. Removing the component rail from the bracket rail

3. Put the component rails to one side. You will attach them to the rack server chassis later, in the section, "Attaching Component Rails to the Server."

The next figure shows the separated bracket rail with its inner sliding piece and the flat, one-piece component rail.

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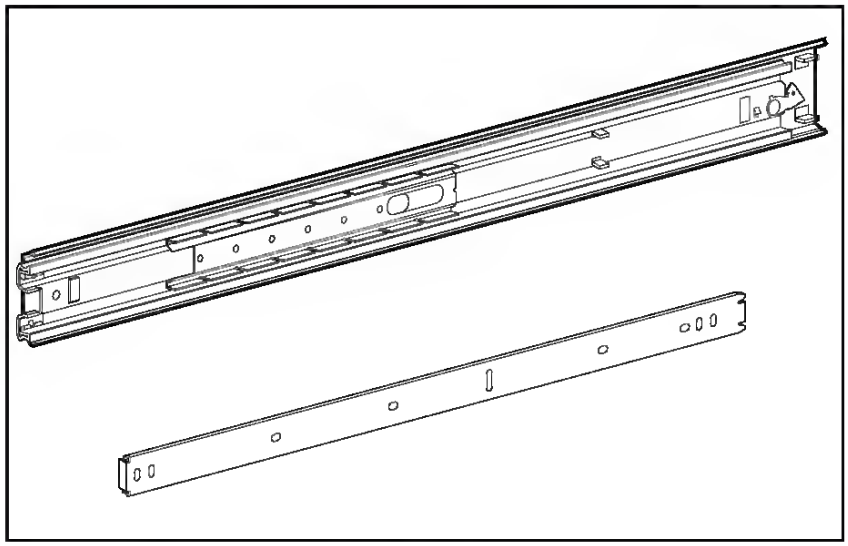

Figure 4-6. Separated bracket rail (top) and component rail

The bracket rail consists of a fixed outer rail that screws to the rack mounting bracket, and an inner slide on a steel ball bearing movement. This inner slide does not detach.

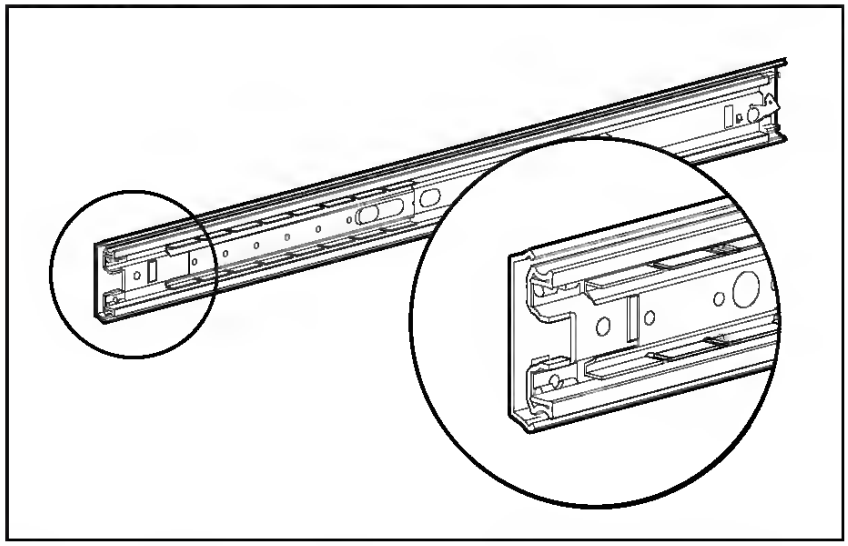

Figure 4-7. Bracket rail with inner slide. The front of the rail is highlighted.

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4. Lay the bracket rail inside the mounting bracket with the front of both pieces oriented in the same direction. Align the front screw holes in the mounting bracket and the bracket rail.

   To identify the front of the mounting bracket and the bracket rail:

   - The front of the mounting bracket has alignment tabs on its flange.
   - The front of the bracket rail allows the inner slide to move forward on ball bearings.

5. Extend the inner slide from the front of the bracket rail. With this piece extended, you will see two screw holes aligned in the mounting bracket and the bracket rail. These are the two exposed holes near the back end of the bracket rail and the front hole accessible through a slot in the inner slide.

6. Fasten the bracket rail to the mounting bracket with two 8-32 x 1/4-inch slotted screws. (Do not use nuts or washers with the screws.) See step ❶ of the following figure.

7. Adjust the inner slide to access the other two screw holes, one at a time, through the slotted opening in the inner slide. Use two more 8-32 x 1/4-inch slotted screws to fasten the bracket rail to the mounting bracket. See steps ❷ and ❸ of the following figure.

The following figure shows inserting the screws into the appropriate holes. The screws will line up with the 22-inch markings stamped along one edge of the mounting bracket. These marks identify the mounting holes for the 22-inch slides used in Compaq racks. (The 24-inch markings stamped along the other edge are for use with the 24-inch slides that support other components.)

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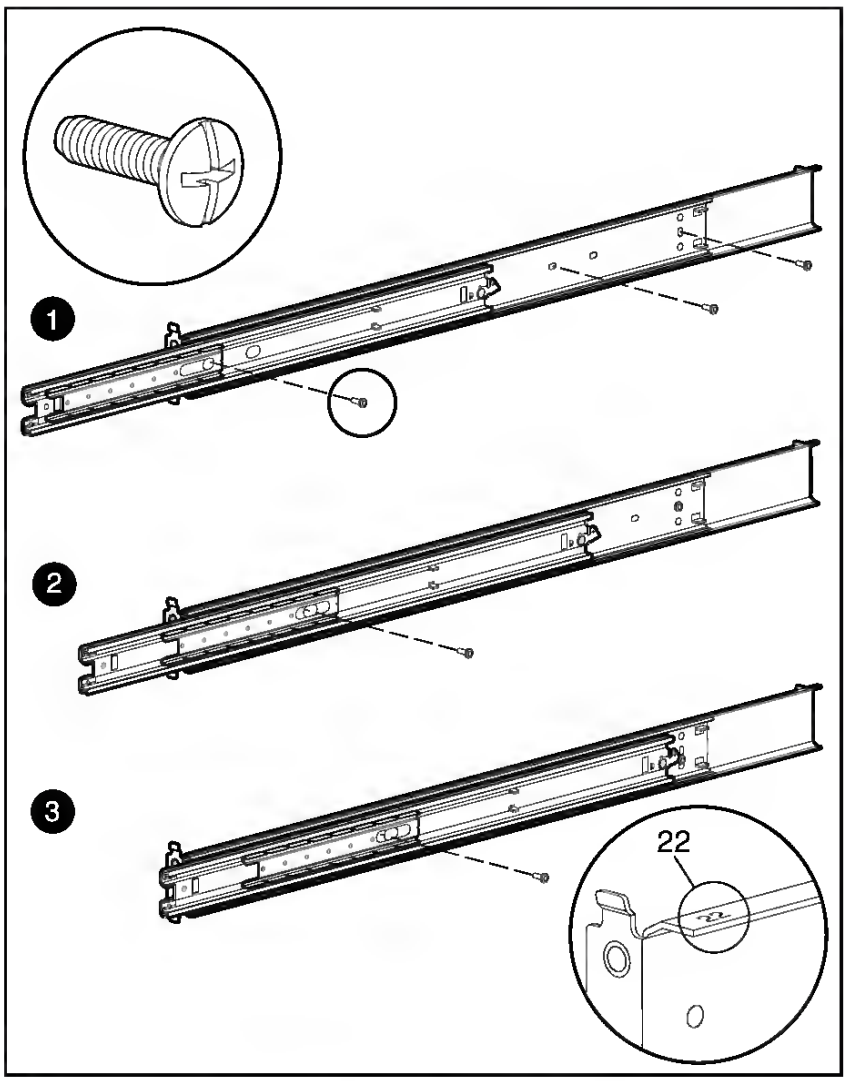

Figure 4-8. Attaching the bracket rail to the mounting bracket

You will use a total of five 8-32 x 1/4-inch slotted screws to fasten the bracket rail to the mounting bracket. When all five screws are fastened, the mounting bracket and bracket rail form a mounting bracket slide assembly that you will attach to the rack.

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8. Repeat steps 4 through 7 with the other bracket rail and mounting bracket. You now have a pair of mounting bracket slide assemblies to be attached to the rack.

Attaching the Mounting Bracket Slide Assembly to the Rack

WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that the rack leveling feet are extended to the floor and support the full weight of the rack. Each rack must be level and stable. Racks that are not coupled together require the installation of stabilizers. This **must** be done before you perform any work on the rack.

See the *Rack Planning and Installation Guide* for more information on leveling feet and stabilizers.

Measuring with the Template

The template provided with the server offers an easy and reliable way to properly position the server in the rack. Use the tabs on the template to suspend it from the **lower** hole of a two-hole set of perforations in the vertical side rails. Pencil mark the attachment points for the mounting bracket assemblies, the cage nuts for the face-plate thumb screws, and the top of the server. Use the tick marks on the rack side rails to insure level installation of the server. See illustrations and instructions printed on the template.

IMPORTANT: Determine the server's place in the rack **before** you start installing the mounting bracket assemblies. To remind you of the proper placement of the server in the rack, refer to the Rack Builder report you printed when you planned your rack configuration. Always mount the heaviest item on the bottom of the rack and work from the bottom to the top.

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1. Starting at the bottom of the rack, or at the top of a previously mounted component, measure the screw hole locations for the server's mounting bracket assemblies. Pencil mark the locations on the outside of the rack. Do this on both the front and the back of the rack.

IMPORTANT: The template is two-sided (front and back) and printed with arrows that show you where the screws will be inserted, both for the mounting bracket assemblies and for the thumb screws that will secure the server's face plate to the front of the rack.

Align the template carefully with the holes on the rack, to determine the exact placement of the screws.

---

2. When you mark the positioning of the mounting bracket screws, also mark the positioning in the front of the rack for the cage nuts. These are two slots marked "C" on the template. The cage nuts will hold the thumb screws through the server's face plate, as shown in the following figure.

Be sure to follow the alignment instructions on the template, and keep the sides of the template squared up with the sides of the rack. Tick marks on the rack's vertical rails will help you maintain the proper alignment.

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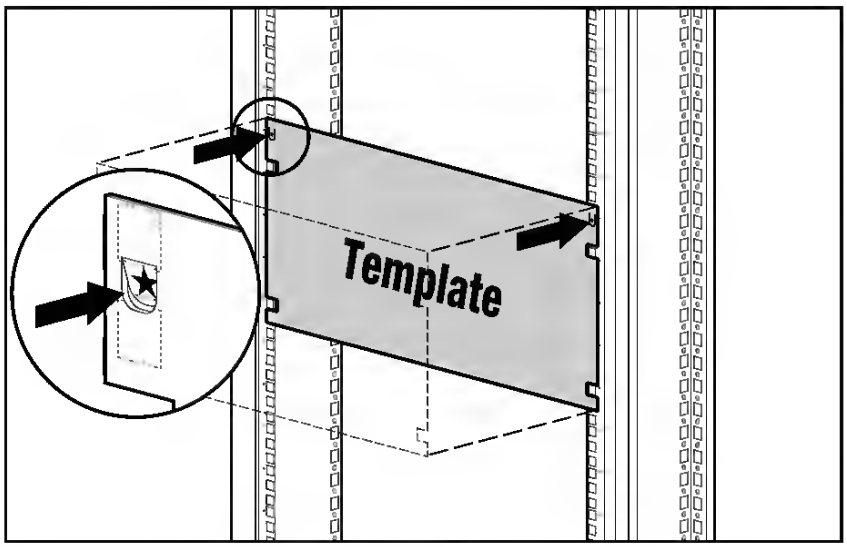

Figure 4-9. Measuring with the template

3. After marking the front of the rack, flip the template over and mark the back rails of the rack. Open the rear door of the rack to access the back rails.
4. On the back of the rack, also mark the rail to show the top of the template. This will help you align a template for the next component.

Inserting Cage Nuts in the Rack Frame

After marking the positions for the fasteners in both the front and back of the rack, use the fitting tool to insert cage nuts on the **inside** of the rails at the marked locations. The cage nuts and fitting tool are included in the hardware kit supplied with the rack.

1. Position the cage nut as shown in the following figure, on the inside of the rail.
2. Hook one of the lips of the cage nut through the square rail perforation.

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3. Insert the tip of the fitting tool through the other side of the perforation and hook the opposite lip of the cage nut.

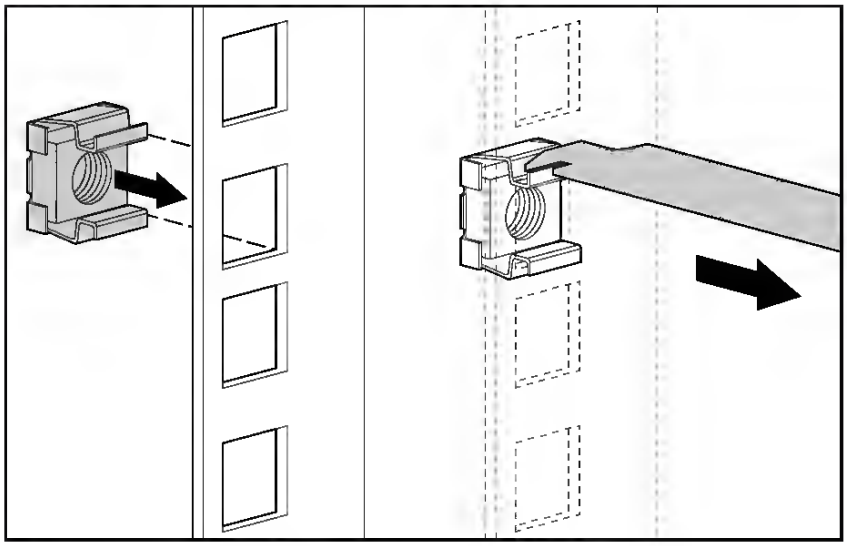

Figure 4-10. Inserting cage nuts

4. Using the fitting tool as a lever, pry the cage nut into position.
5. Repeat for each cage nut.

Attaching the Mounting Bracket Assembly to the Rack

The tabs on the front of the mounting bracket help to align it with the front of the rack frame. Cage nuts are not used for the front attachment of the mounting bracket.

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1. Attach a mounting bracket assembly to the front of the rack first, using one M6 x 1.0-12L Phillips screw in the bottom hole of the bracket. Do not use washers.

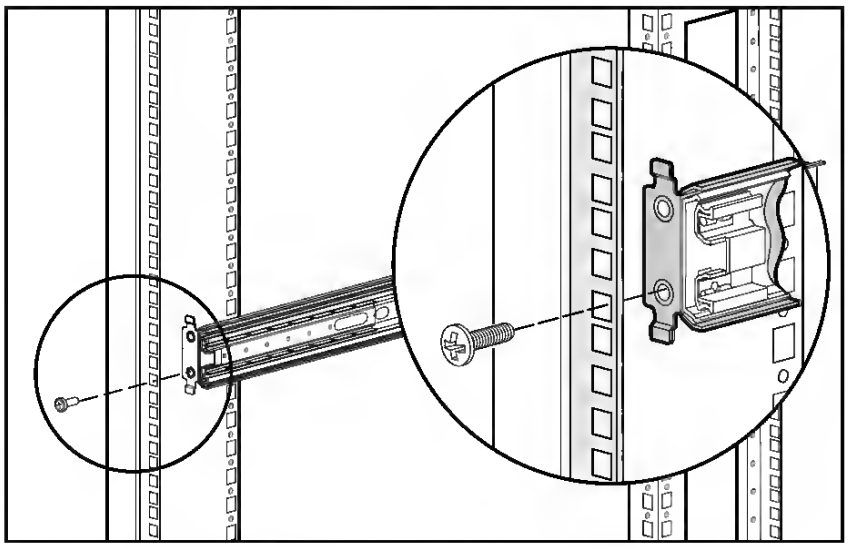

Figure 4-11. Attaching mounting bracket assembly to the front of the rack

2. Carefully align the mounting bracket assembly with the rear rack frame.
3. Secure the back end of the mounting bracket assembly to the back corner brace of the rack with one M6 x 1.0-12L Phillips screw through the bottom hole of the bracket and the cage nut, as shown in the following figure.

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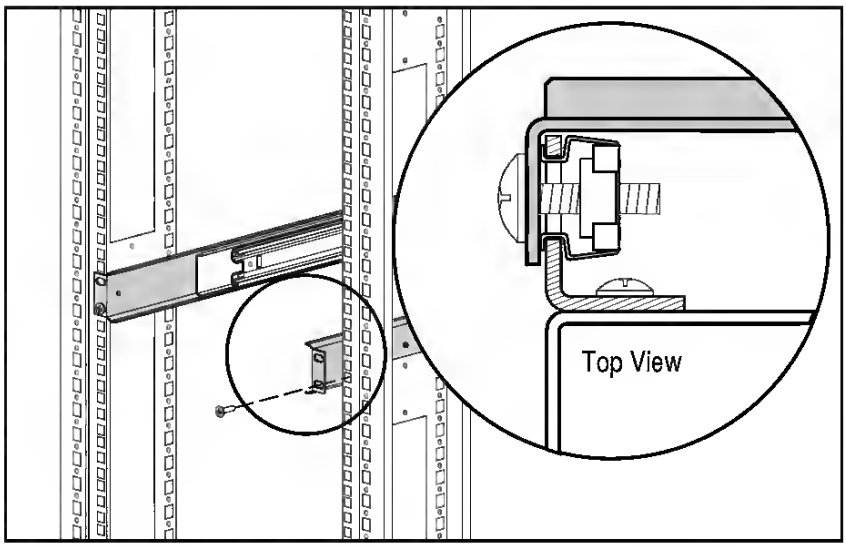

Figure 4-12. Cage nut and back of mounting bracket assembly installed

4. After attaching both of the mounting bracket assemblies to the rack, prepare the server for mounting in the rack.

Attaching Component Rails to the Server

1. Place the tab on a component rail at the front of the server chassis. The holes in the component rail will line up only one way with the chassis.
2. Attach the flat side of a component rail to each side of the server chassis with five 8-32 x 1/4-inch Phillips screws. Do not use washers with the screws.

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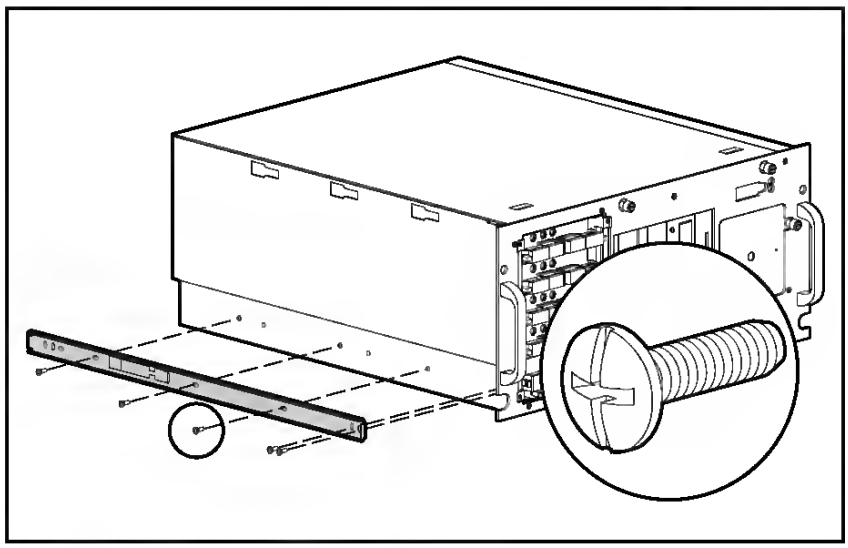

Figure 4-13. Attaching a component rail to the server

Attaching the Cable Management Arm Bracket

The cable management arm bracket fastens to the top right rear of the rack server's chassis. The bracket provides an attachment point for the cable management arm from the server to the rear frame of the rack.

Attach the cable management arm bracket to the back of the server with two 6-32 x 1/4 Phillips screws.

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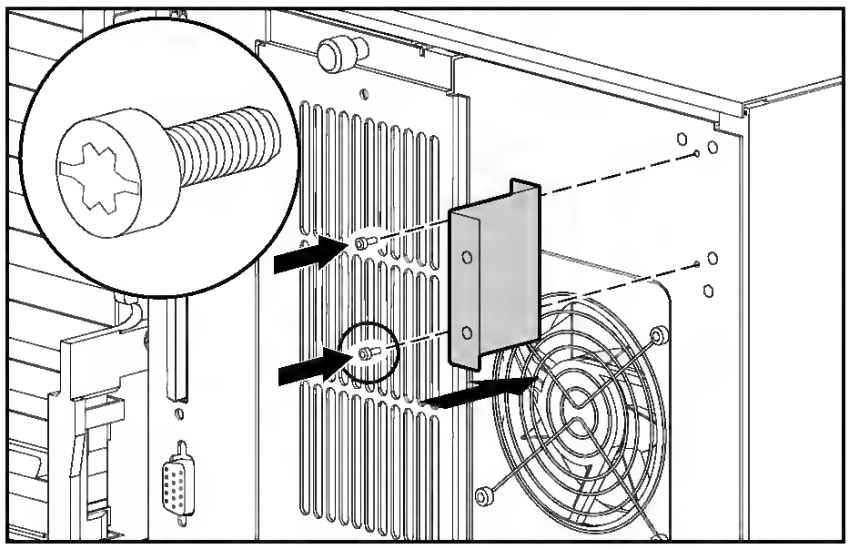

Figure 4-14. Attaching a cable management arm bracket to the server

Loading the Rack Server

Load and secure the server to the rack with the face plate thumb screws before continuing to attach any more mounting bracket assemblies. Ensure that this pair of brackets is perfectly aligned and installed and that the server fits before you continue.

WARNING: To avoid the risk of personal injury or damage to the equipment, a minimum of two people **MUST** lift the server into the rack. The server weighs 50 pounds (22.6 kilograms). If the unit is to be loaded above chest level, a third person must assist in aligning the rails while the other two support the unit.

IMPORTANT: To make the server lighter and more manageable, do not install drives in the server until after you load the server into the rack.

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1. Pull the slide rails forward from the mounting brackets.
2. Carefully align the server's component rails with the rack's slide rails and slide the server into the rack.

CAUTION: Be sure to keep the component parallel to the floor when sliding the component rails into the slide rails. Tilting the component up or down could result in damage to the rails.

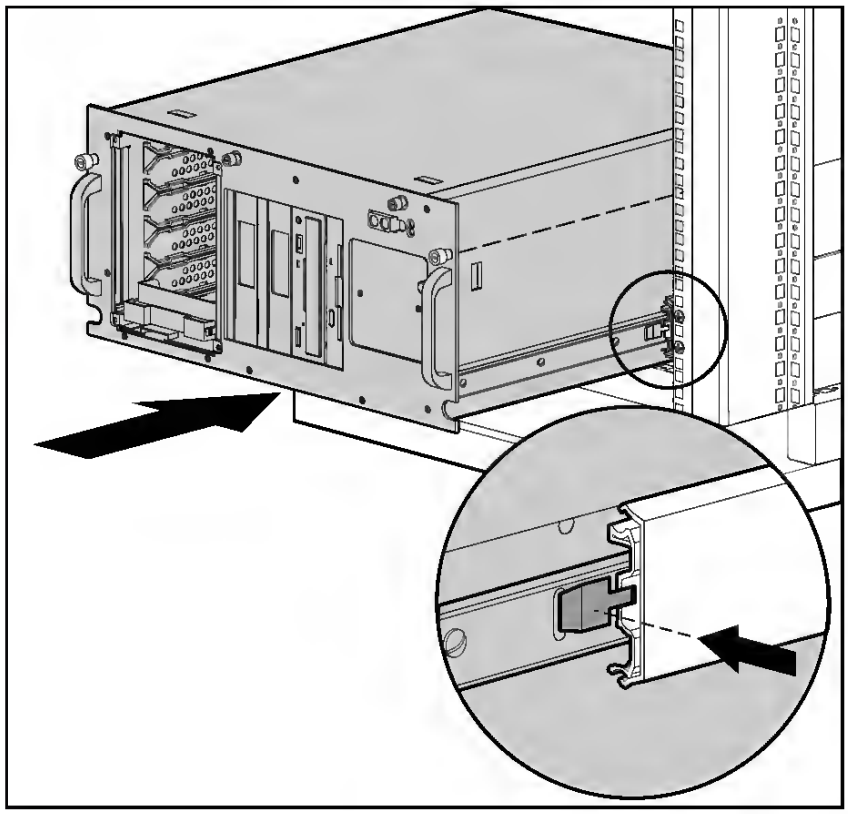

Figure 4-15. Loading the rack server

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WARNING: To avoid the risk of personal injury, be careful when pressing the component rail release latches and sliding the component into the rack. The slide rails could pinch your fingertips.

3. Depress the component rail release latch on either side of the server and slide the server into the rack.

IMPORTANT: The first time you slide the component into the rack, you may have to apply some pressure. After the first time, the ball bearings in the slide will move easily.

IMPORTANT: When servicing the server, fully extend the component until the latches lock. To return the server to the rack, depress the latches and slide the server into the rack.

4. Secure the server face plate to the front of the rack by screwing the thumb screws into the cage nuts.
5. Tighten the thumb screws before you close the rack door to prevent the door from hitting protruding thumb screws.

Attaching the Cable Management Arm

A double-hinged cable management arm and fasteners ship with each server. The cable management arm attaches to the server's cable management arm bracket and to the rear frame of the rack. All cables to and from the server are tied to this arm. The two hinges allow the cable management arm with attached cables to swing out of the way when you need to access the server pull-out trays.

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1. For easier handling, first slide the server into the rack, then attach the cable management arm to the cable management arm bracket. If you attach the arm before loading the server in the rack, the arm may swing around and interfere with the loading process.

2. After you have loaded the server into the rack, attach one end of the cable management arm to the server's cable management arm bracket using two M6 x 1.0-12L Phillips screws. Align the arm to the bracket as shown in the following figure.

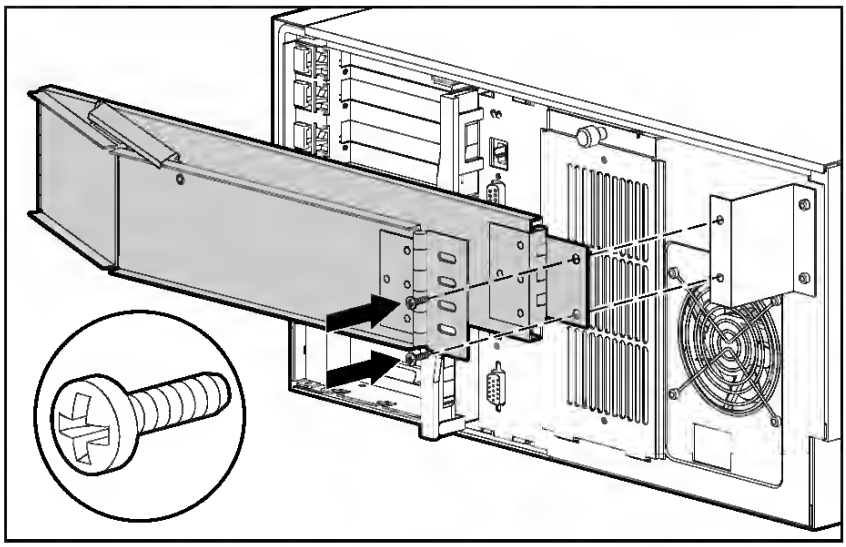

Figure 4-16. Attaching the cable management arm to the cable management arm bracket

3. Align the other end of the cable management arm on the outside of the rear brace of the rack. Align a screw retaining plate on the inside of the rack. Attach the arm to the rack with two 10-32 x 5/8-inch Phillips washer-face hex-head screws.

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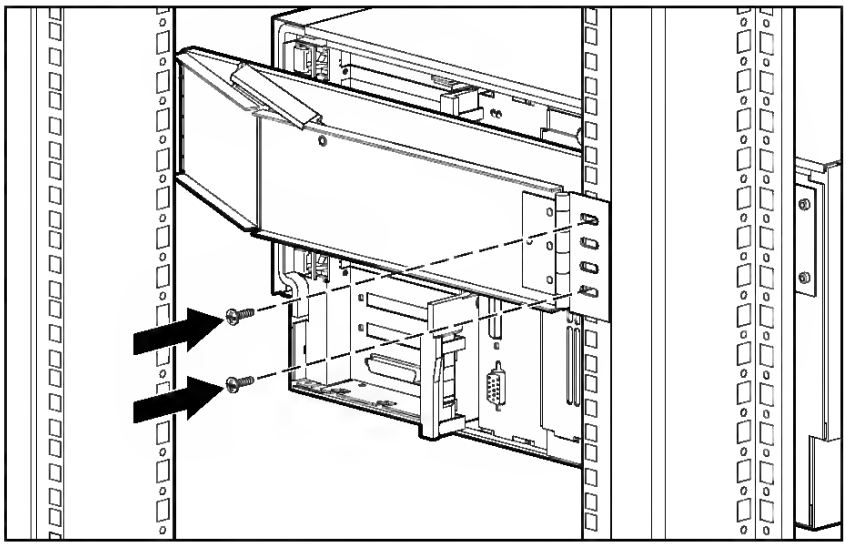

Figure 4-17. Attaching the cable management arm to the rear brace of the rack

Attaching the Optional Cable Support

The optional cable support attaches to both sides of the rear frame of the rack. All cables to and from the server are tied to this support, which allows the server cables to stretch from the right rear of the server across to the cable channel on the other side of the rack, where the other cables are all bundled in the cable channel.

The cable support is needed only if you intend to route cables from one side of the rack to a cable channel on the other side of the rack.

Attach the cable support to both rear braces of the rack using four M6 x 1.0-12L Phillips screws.

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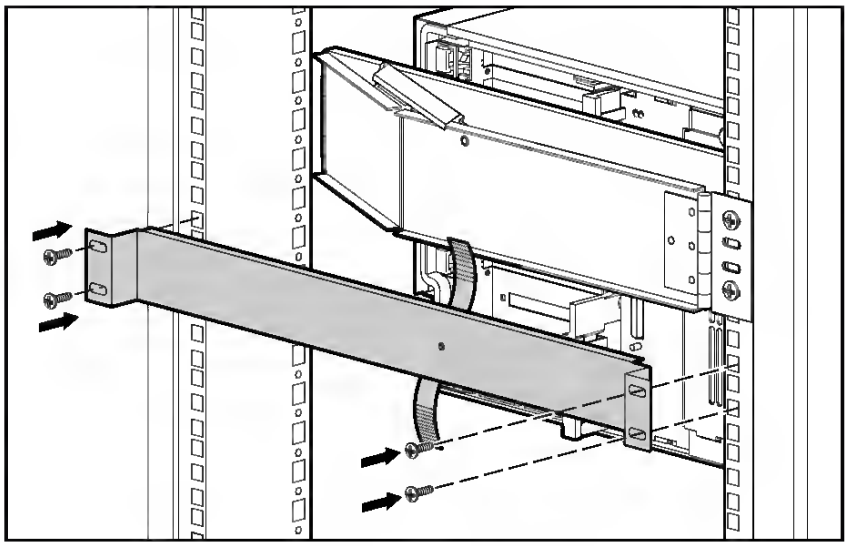

Figure 4-18. Attaching the cable support to the rack

Cabling the Server

1. Plug the power cable into the server.

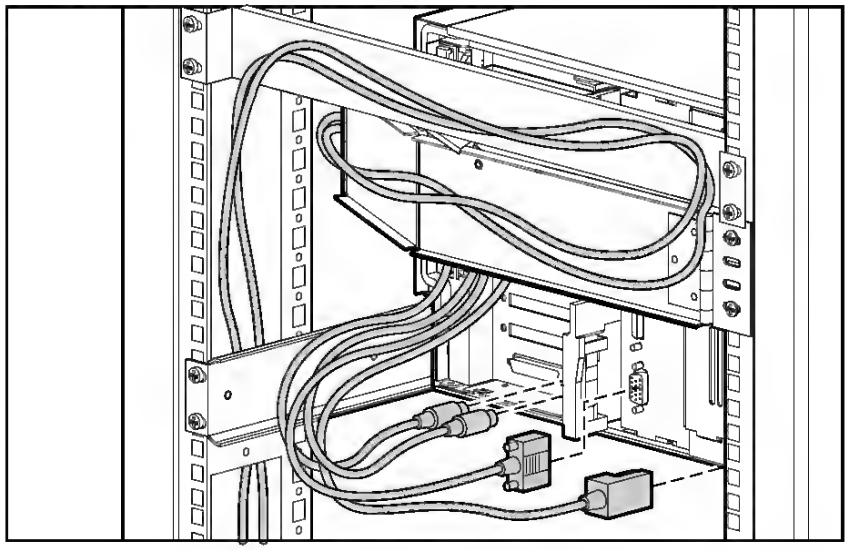

Figure 4-19. Cabling through the cable management arm and cable support

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2. Plug in any remaining cables: for example, network cables, or SCSI cables.

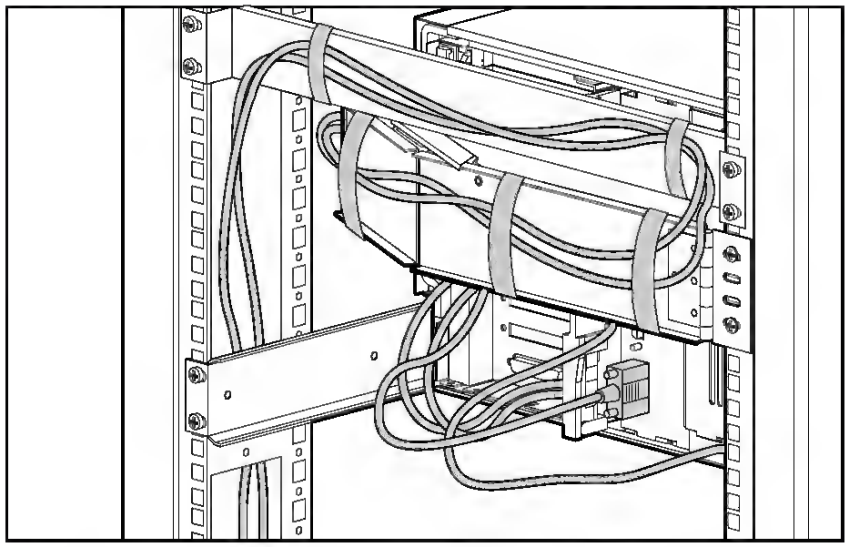

Figure 4-20. Routing and securing the cables

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3. If you install a switch box in the rack, route the CPU-to-switch-box cables to the switch box.
4. Bundle all of the cables, including the power cable, and tie them to the cable management arm.
5. If you are going to route cables to the other side of the rack, attach the bundled cables to the cable support and join the other cables in the opposite cable channel.
6. Extend the bundled cables down the rack's cable channel.

Before loading another component, be sure to secure the server to the rack using the face plate thumb screws.

Powering Up and Configuring the Server

After the cables have been connected, you are ready to power up the server. Refer to Chapter 3, "Overview of Installing ProLiant 2500 Server and Hardware Options," for the power-up and configuration procedures.

Accessing the Processor Board and I/O Tray

To service your rack-mounted server, you need access to the processor board and the I/O tray, as shown in the following sections.

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Servicing the Processor Board

Swing the double-hinged cable management arm to one side to gain access to the processor board.

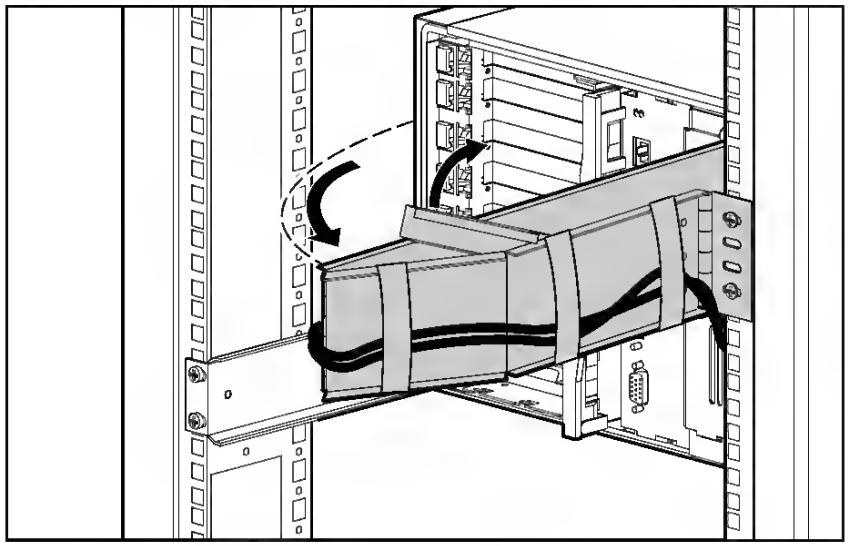

Figure 4-21. Moving the double-hinged cable management arm to access the processor board

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Servicing the I/O Tray

To gain access to the I/O tray:

1. Loosen the front plate thumb screws and extend the server from the front of the rack.
2. Loosen the thumb screw that secures the side access panel.

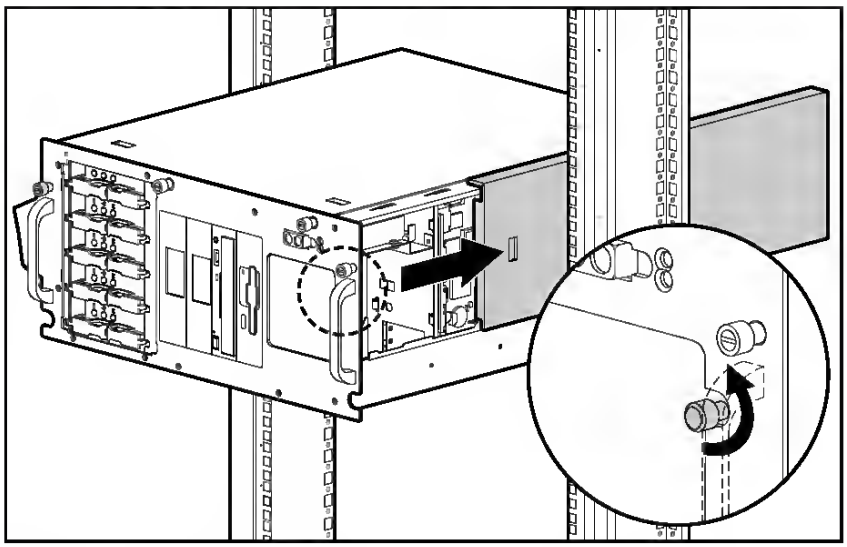

Figure 4-22. Removing the rack side panel for access to the I/O tray

3. Slide the side access panel toward the back of the server.

Optional Installation Service

The installation service covers the entire hardware installation from unpacking the components to routing the cables and running a test of the system. In the United States, Compaq will make all of the arrangements to have the rack system installed by qualified Guaranteed Service Providers. An order form with pricing is available from PaqFax, the Compaq fax retrieval service. Call 1-800-345-1518, select PaqFax, and request Document No. 4552. Installation may also be ordered from and provided directly by Authorized Compaq Service Providers.

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Appendix A
Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megaohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

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If you do not have any of the suggested equipment for proper grounding, have an Authorized Compaq Reseller install the part.

NOTE: For more information on static electricity, or assistance with product installation, contact your Authorized Compaq Reseller.

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Appendix B
Specifications and Connector Interfaces

This appendix provides operating and performance specifications for the following Compaq ProLiant components:

- Compaq ProLiant 2500 (all models)
- Compaq ProLiant 2500R (all models)

For other specifications, refer to the Systems Reference Library CD.

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ProLiant 2500 (All Models)

Table B-1
ProLiant 2500 (All Models)

Dimensions		
Height	17.92 in	45.52 cm
Depth	22.67 in	57.58 cm
Width	8.83 in	22.43 cm
Weight		
No Drives Installed	50.0 lb	22.68 kg
Input Requirements		
Rated Input Voltage	100 to 240 VAC	
Rated Input Frequency	50 - 60 Hz	
Rated Input Current	6 - 3 A	
Power Supply Output Power		
Rated Steady-State Power	325 W	
Maximum Peak Power	425 W	
Temperature Range		
Operating	50° to 95° F	10° to 35° C
Shipping	-22° to 122° F	-30° to 50° C
Relative Humidity (noncondensing)		
Operating	8% to 90%	8% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum Wet Bulb Temperature	101.7° F	38.7° C

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ProLiant 2500R (All Models)

Table B-2
ProLiant 2500R (All Models)

Dimensions		
Height	8.67 in	22.02 cm
Depth	22.75 in	57.78 cm
Width	19.0 in	48.26 cm
Weight		
No Drives Installed	50.0 lb	22.68 kg
Input Requirements		
Rated Input Voltage	100 to 240 VAC	
Rated Input Frequency	50 - 60 Hz	
Rated Input Current	6 - 3 A	
Power Supply Output Power		
Rated Steady-State Power	325 W	
Maximum Peak Power	425 W	
Temperature Range		
Operating	50° to 95° F	10° to 35° C
Shipping	-22° to 122° F	-30° to 50° C
Relative Humidity (noncondensing)		
Operating	8% to 90%	8% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum Wet Bulb Temperature	101.7° F	38.7° C

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Connector Interfaces

For the pinouts and signals of these connector interfaces, refer to the Systems Reference Library CD:

- Keyboard (hot-pluggable)
- Pointing Device (Mouse)
- Serial (2)
- Parallel
- Monitor
- SCSI-2 Connector
- Ethernet (RJ-45 and AUI)

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Appendix C
Power Cord Set Requirements

The power cord set meets the requirements for use in the country where you purchased your equipment. The voltage selection switch allows you to select the appropriate line voltage for your server.

Power cord sets for use in other countries must meet the requirements of the country where you use the server. For more information on power cord set requirements, contact your Authorized Compaq Dealer.

General Requirements

The requirements listed below are applicable to all countries:

- The length of the power cord must be at least 6.00 feet (1.8 m) and a maximum of 8 feet (2.4 m).
- The power cord set must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord will be used.
- The power cord set must have a minimum current capacity and nominal voltage rating of 10 A, 125 volts AC or 10A, 250 volts AC, as required by each country's power system.

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Country-Specific Requirements

Use the following table to identify the appropriate accredited agency in your country.

Table D-1
Power Cord Set Requirements - By Country

Country	Accredited Agency	Applicable Note Numbers
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	SETI	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	JIS	3
Norway	NEMKO	1
Sweden	SEMKO	1
Switzerland	SEV	1
United Kingdom	BSI	1
United States	UL	2

Notes:

1. Flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm^2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. Flexible cord must be Type SVT or equivalent, No. 18 AWG, 3-conductor. Wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V).
3. Appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, 1.0 mm^2 conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.

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Appendix D
Regulatory Notices

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (i.e., personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC ID on the label. Class A devices do not have an FCC ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Canadian Notice

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Avis Canadien

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Canadian Notice

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Avis Canadien

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

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European Union (EU) Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms:

- EN55022 (CISPR 22) - Electromagnetic Interference
- EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity
- EN60950 (IEC950) - Product Safety

Japanese Notice

お使いになっている装置にＶＣＣＩマークが付いていましたら、次の説明文をお読み下さい。

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。
しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。
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ＶＣＣＩマークが付いていない場合には、次の点にご注意下さい。

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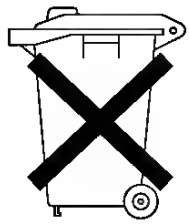
Battery Notices

Battery Recycling Notice

NL

Niet weggooien, maar inleveren als KCA.



This product contains an internal Lithium Manganese Dioxide or Lithium, Vanadium Pentoxide, or alkaline battery. Replacement should be performed by a qualified Compaq service technician.

Battery Replacement Notice

WARNING: Your Server is provided with a battery powered Real-Time Clock circuit. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Do not attempt to recharge the battery, disassemble it, immerse it in water, or dispose of it in fire. Replacement is to be done by an Authorized Compaq Service Provider using the Compaq spare designated for this product.

For more information about the Real-Time Clock battery replacement or proper disposal, contact your Authorized Compaq Reseller or your Authorized Compaq Service Provider.

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Laser Safety

All Compaq systems equipped with CD-ROM drives comply with appropriate safety standards, including IEC 825. With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class 1 laser product. It does not emit hazardous light; the beam is totally enclosed during all modes of customer operation and maintenance.

CDRH Regulations

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured after August 1, 1976. Compliance is mandatory for products marketed in the United States.

This device is classified as a Class 1 laser product as defined by the CDRH regulations (CFR 1040.10, para. b, item 5). This means that this is a Class of laser products that does not emit hazardous laser radiation; this is possible only because the laser beam is totally enclosed during all modes of customer operation.

The laser produces a beam that, if looked into, could cause eye damage, Installation and Service procedures must be followed exactly as written without change.

WARNING: Use of controls or adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

WARNING: Because the internal laser beam may cause eye damage, do not open the cabinet. Wearing glasses and contact lenses, etc., increases the hazard. All maintenance should be performed by an Authorized Compaq Service Provider.

International Regulations

This device is designed to comply with the appropriate safety standards, including IEC950 and IEC825. This device is classified as a Class 1 laser product as defined by IEC825. The following label (or equivalent) is located on the surface of your CD-ROM drive.

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Laser Product Label

This system is classified as a CLASS 1 LASER PRODUCT. This label is located on the outside of your system. A similar label also appears on the internal CD-ROM installed in your system.

Laser Specification

Laser Type:	Semiconductor GaAIAs
Wave Length:	780 +/- 35 nm
Divergence Angle:	53.5 Degree +/- 1.5 Degree
Output Power:	Less than 0.2mW or 10,869 $W \bullet m^{-2} sr^{-1}$
Polarization:	Circular
Numerical Aperture:	0.45 +/- 0.04

Only authorized technicians trained by Compaq should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

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Appendix E
Using the Internal CD-ROM Drive

The Internal CD-ROM drive is a random access, read-only storage device capable of retrieving data from removable compact disc media, which can store up to 680 Mbytes of digital information.

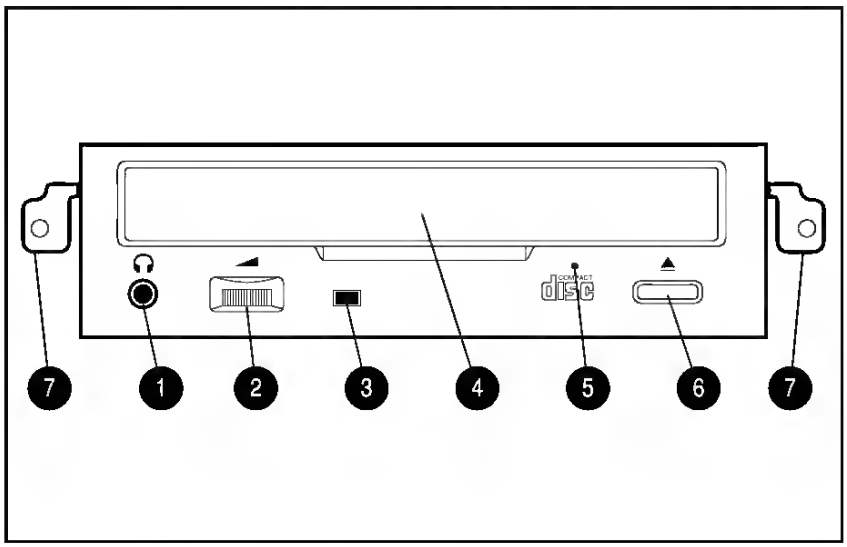

Figure E-1. Internal CD-ROM Front Panel

Table E-1
Internal CD-ROM

Ref	Component	Function
❶	Headphone Jack	Connects the headphone
❷	Headphone Volume Control	Increases or decreases the headphone volume
❸	Busy Indicator	Turns green when a disc is present; flashes amber when the drive is reading a CD
❹	Disc Tray	Slides in and out. Holds the CD in place
❺	Manual Eject Hole	Allows you to manually eject a CD if the load/unload button is inoperable
❻	Load/Unload Button	Opens and closes the disc tray
❼	Drive Rails	Supports the CD-ROM drive

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Opening the Tray Automatically

By following the instructions below, you can open and close the Internal CD-ROM tray using the automatic load/unload button. Ensure plenty of clearance for the tray to open and close.

1. With your computer turned on, open the removable media access door by first pressing on the left side of the door ❶. Fully open the door ❷ to access the CD-ROM drive.

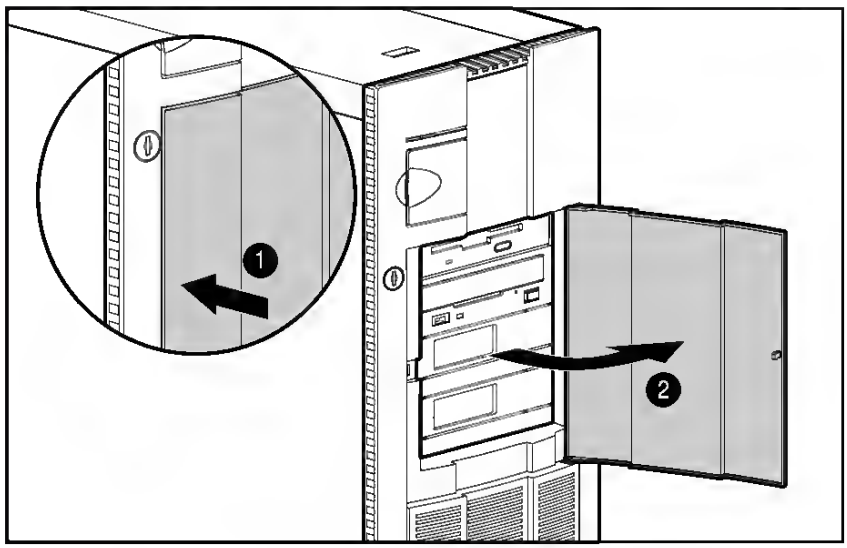

Figure E-2. Opening the Removable Media Access Door

2. Open the Internal CD-ROM tray by pressing the load/unload button on the front panel of the drive.

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3. Place the Internal CD-ROM disc ❶ in the tray, handling the Internal CD-ROM disc from the edges, not the flat surfaces of the disc.

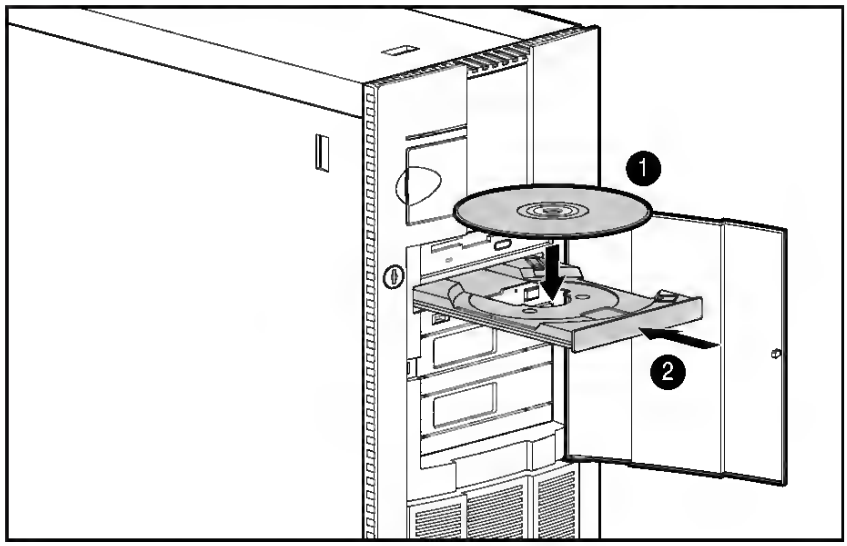

Figure E-3. Opening the Internal CD-ROM Tray

4. Close the tray by again pressing the load/unload button ❷.

   The drive performs a diagnostic check and automatically begins reading the table of contents. The busy indicator turns amber while the drive reads the table of contents.

   NOTE: The tray automatically opens if the disc is upside-down, not properly nested in the tray, or if any other condition prevents the drive from reading the disc.

5. When the busy indicator turns green, the drive is ready to receive commands and data may be retrieved from the disc.

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Opening the Tray Manually

If the tray will not open automatically, you can open it manually by using the emergency load/unload button.

NOTE: Certain applications or operating system software may disable the load/unload button to prevent accidental damage to the disc. If the load/unload button is disabled by the application software, it will not operate.

CAUTION: Before beginning this procedure, turn off the power to your computer.

1. Insert a metal rod such as a straightened paper clip into the manual eject hole ❶ and push firmly. The tray releases.

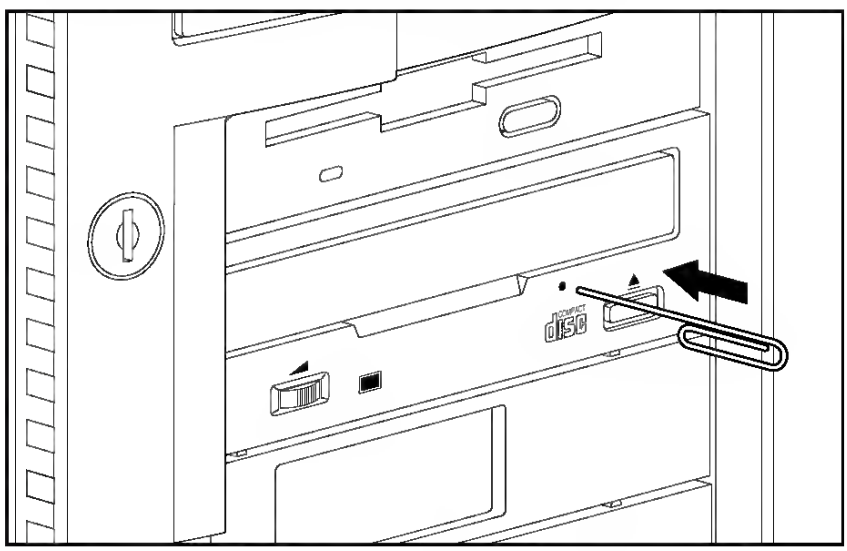

Figure E-4. Opening the Internal CD-ROM Tray Manually

2. Slowly pull the tray out from the drive until the tray is fully extended, then remove the disc.

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